# JOURNAL OF DENTAL EDUCATION

Volume 18 MARCH, 1954 Number 2

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# JOURNAL of Dental Education

*A Quarterly for the Dental Teacher*

**Volume 18** **MARCH, 1954** **Number 2**

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# JOURNAL of Dental Education

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We are here not to get all we can out of life for ourselves, but to try to make the lives of others happier.

—Sir William Osler

# THOSE PRECLINICAL SUBJECTS

MAX S. MARSHALL, B.S., M.A., Ph.D.,[1] *San Francisco*

*(Dr. Marshall, for years, has taught microbiology to medical, dental, dental hygiene and pharmacy students at the University of California.—Ed.)*

A great deal of energy is spent on ways and means for teaching preclinical subjects. Much of this debate is only a rattling of disorganized ideals. The clarification of two points in these arguments can make them less complex than they seem to be. The problem has handles.

One point concerns the relationship between the practical and the academic, sometimes called the applied and the fundamental, or technique (technics) and theory. The other point, and the greater one, arises in the modern habit of accepting a design for teaching as more meaningful than the teaching.

The concept of preclinical subjects is itself an administrative expedience rather than a fact. There were once rolltop desks full of pigeonholes which our earnest ancestors stuffed with odd assortments. A naturalist caught birds, butterflies, or bees; his reasons were his own but when he sorted them into piles and put Latin names on them he imposed his order on others. These are reflections of the taxonomic strain in man's makeup which, under control, can be a virtue, but without control often becomes a menace. It is legitimate to question the status of the term "preclinical subjects." There is a room called the clinic, students work there with patients, and there are subjects of training which precede this work. Subjects temporally preceding the work of the clinic therefore should be preclinical subjects. However, clinical men have classroom exercises, preclinical subjects are sometimes clinical, and some subjects, though not clinical, are better presented after clinical work. The term, preclinical subjects, can be useful but it is not a fixation; it is merely a label. It is the odd document put in a pigeonhole of the rolltop desk not because it belongs there but because it has to be put somewhere. Having been put there, we must remember at all times that this disposition was for the sake of convenience: putting it there was not an expression of truth and invariant classification.

English is learned at home and in schools and becomes technical in professional fields, where it acquires the polysyllabic terms common to all professions, many of them designed to impress people, particularly the users. At what point did English become clinical? The idea of

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clinical English is real but has no formal recognition, but try the same thought on biochemistry, microbiology, or any "preclinical subject." That an artificial wall has been put up becomes apparent. It is unwise to separate preclinical phases of fields which, with the right segments joined in the right way, together compose the clinical field. So long as we keep this in mind we can afford to use the term, "preclinical subjects," as a convenience; even so, inexperienced persons will take it at its face value. The empiricism of the term must be emphasized often enough to insure an honest use of the term. No clean line separates preclinical subjects from other subjects; there is an imperceptible merging.

With this understanding "preclinical subjects," perhaps anatomy, physiology, biochemistry, and microbiology, are at one end connected with academic training and at the other end with the clinic. On a given date a student ceases to be a preprofessional student, *on the records* (is it conceivable that he ever ceases to underwrite his professional work with prefaces from added experience?), and, *on the records*, becomes a professional student whose courses suddenly and empirically become "preclinical."

The next step in orientation is an old wheeze of which we seem to need endless reminding, that it is the student who is taught and not the subject. To be sure, a wise professional man will pick up pointers from an expert's performance even though not a word is spoken, and a natural teacher, enthusiastic over his field even though caring not a fig for students, is presenting his subject. The point is that, in both instances, the ones who learned were the observers. There is no way around the simple fact that the main ingredients of a school are teachers and students, and the purpose is learning by the students. The teacher who views his students as a bunch of dodo birds has not escaped and will not escape the fact that the student is the fellow who does the learning, in this case in spite of the teacher rather than because of him. Subjects, curricula, teachers, and debates are all incidental steps in the march toward the real goal.

Since the lines which separate preclinical subjects are understood to be not dividing lines but wide connecting bands, and the main obligation is to teach students rather than subjects, we can proceed to the problems of teaching preclinical subjects. The direct approach though risky is best. For example, a group of microbiologists got together over a period of several years to discuss professional courses in microbiology. They wound up with a predictable standardized recipe for curricular goulash. The mistake is common: failure to see that an attempt to resolve an

inherently specific problem in general terms is improper. Microbiology, biochemistry, or most other subjects cannot be successfully taught by formula. A teacher has both privileges and obligations to adapt himself to his teaching as well as he can. A good teacher is not a robot who merely punches a time clock and carries out an assignment, a dull and regressive process for him and an even duller and less helpful process for his students.

Generically, with the brush cleared away the problems look like this:

1. *Educational fundamentalism:* There is a long-standing debate between those who believe that the fundamental aspects of any subject are the groundworks from which a clinician makes applications (that is, physicists should be able to repair automobiles) and those who think that basic subjects should be realistically presented in direct relationship to the profession (teach the basic physics of the carburetor). Fundamentalists say that the same courses should fit medical, dental, pharmacy, and nursing students, since only the applications differ.

By our postulates, this idea rests on the false assumption that these subjects can be neatly put in pigeonholes. The argument of the educational fundamentalist fails to take into consideration the need for merging chemistry into biochemistry and thence into professional interpretations and uses. Once we see the impact that this taxonomic outlook has in the many sterile debates we realize that preclinical subjects must leave the ivory tower and go to the clinic; they must be transitional. They cannot and should not push aside that which is fundamental; but the basic function of preclinical subjects is to effect the shift from the fundamental to the professional.

The medical professions differ radically in function and in many other respects, in spite of relationships and needs for accord. A purely fundamental outlook necessarily precedes professional training. Students in all medical professions, for instance, enter their professional schools with at least chemistry and English. The obligation of the physiologist, biochemist, or microbiologist is to start from whatever basic training the students sent to him may have and to carry on from there to the threshold of the clinic, leading the way from one stage to the other. Teaching deals with a curve of change; it is a calculus and not an algebra.

Comparable courses for the different medical professions start alike but should not be identical because in the end the applications to the patients are sharply different. There are reasons for the choice of a medical profession and for the selection of a particular one. Students entering each professional school have different backgrounds also. It is

simply a fact that preclinical courses should not be identical, within the professional schools. The theory of educational fundamentalism, in the early stages of a course apparently so acceptable, is not acceptable beyond a given early point. Any teacher in a professional school who produces an essential strictly fundamental course in a preclinical subject should immediately have his course honorably removed and put on the academic campus.

2. *The student*: The student is the fellow on whom teachers, schools, and professions must depend. We are supposed to prepare professional students for their professions. We divide knowledge into subjects and, for practical reasons, develop everything from departmental budgets to separate outlooks, but students do not in the least care so long as there is steady progress in terms of advancement toward professional training from the freshman year to graduation.

This being true, the type of student who appears for a profession should be met on his own ground. Dentistry perhaps furnishes the clearest example. What sort of student chooses dentistry as a profession, what sort of student is accepted into a college of dentistry, and what sort of student best serves his community and himself when he graduates? These questions are basic, though they should not be precisely answered. There is bound to be a great range of characteristics in any group of students; only a broad perspective is permissible.

A dental student is usually and primarily a doer. Dentistry is no field for a lazy man. Most students see this or find it out early. By "lazy" I refer to the old-fashioned meaning, by which "work" meant visible accomplishment with the hands and maybe the shoulders and back, however much or little mental effort or ability was required. Digging potatoes was more "work" than repairing a watch, but both qualified as work. By and large, dental students want to dig in and get tangible results. They will do things over, show protracted patience, and sit up all night on occasion, but they do not get too seriously discontented as long as something is being accomplished. However, an hour with a book to many of them looks like a fairly long time. Not a few would rather undertake what to many others would be an arduous task rather than write a paper. They are ingenious and alert, like all doers, but they want to exercise these qualities on something concrete, some technical problem, preferably related to their professional work.

Although clinical teachers, who were such students, follow this idea automatically, little time has been spent in making use of this fact in preclinical subjects. In general discussions about the education of dentists,

the usual principals are dentists. They consider with enthusiasm everything from television to case demonstrations, trying to convert their own "doing" tactics to the task of the other fellow, the fellow who teaches preclinical subjects. It is not up to these men but to departments to learn to make use of the dental aptitude. How to use this aptitude is strictly a departmental problem.

For example, we learned long ago that dental students will interpret instructions and carry out procedures in the laboratory faster and more accurately than medical students. When results seemed imperfect to dental students, tests were repeated without suggestion or request; yet relatively little effort went into questioning themselves and each other, into interpreting the results. "But this *is* the result," they said. It took little study to discover that medical students, at our stage about equally involved in laboratory courses, did their work entirely as an aid to understanding, whereas dental students were spending nearly all their many laboratory hours working toward accomplishment. In some phases of clinical medicine a similar training for proficiency is given; on such occasions I would bet ten to one on the more rapid prowess and superior proficiency of dental students.

This is a concrete example of a noteworthy distinctive characteristic which should be utilized in teaching. To use it, it must be adapted to the course, teacher, and department. A few principles can be evolved, but for the most part the generalization should cease at this point. The department should go home, close its doors, and resolve the problems in terms of its own subject, courses, and staff.

For example, a department must somehow in its teaching make use of the extraordinary ability of dental students to turn out work. To do this it has to take advantage of the students' capacities for volume production and technical detail, and of their natural method of learning, through analysis of observed facts and tangible data. Give these students a problem which requires that they develop a technique that involves basic learning (how would you find the number of bacterial spores in a liter of air?) and they have something with which they can come to grips and learn. Ask them to read Pasteur's original experiments on the same thing and you have lost them. However, I would expect more medical students to approve the latter; to the technical problem some of them have been heard to say "Who cares?" or "They probably have a dozen machines for it."

This is only another way of saying that it is the student who is taught, converting the general thought to greater specificity and putting more

emphasis on the student. There are useful signs in the ages, backgrounds, bases of selection, and the machinations which determine the choice of professions, guideposts which point the way to methods for professional groups, like dentistry, and sometimes to methods for the finer shades of individual treatment. In this regard, the label of "preclinical subjects" helps particularly in one respect. These subjects rely heavily on work in the laboratory, an expensive procedure we believe to be necessary for realistic understanding and which students and teachers use for this understanding in ways varying greatly in effectiveness. Many laboratories are only work-farms, with overseers for teachers.

3. *The medical professions:* The path of transition from the freshman year to graduation is often dotted with imaginary relationships put forth to dramatize the importance of the subject. That is, egos are inflated and the prestige of a course is enhanced by association with realms of unquestioned stature, like surgery or internal medicine. Dentistry has been full enough of these. Citing of examples might cause some faces to be red in anger or embarrassment. I think, however, that we have refrained in our own course, microbiology, not so much in denial of the usefulness of legitimate drama as in the belief that drama for its own sake is often illegitimate and therefore false teaching. Even those who believe that strategy should be put over truth to gain a legitimate end must admit that students who see these tactics, and many do, even in retrospect, are not only falsely taught, but also they are taught by their teachers that falseness is approved. Those who do not see the error, meanwhile, carry into their professions false impressions which, being untrue, must in the long run do more harm than good.

One of the oldest tricks of teaching is to try to show that everything is related to and dependent on your subject, making it the most important subject. My class, with bitter satire because clinical courses were yet to come, once posted a list of the "most important subjects in medicine." The list omitted only one or two courses the teachers of which did not oversell their subjects, nor undersell them either, a fact fully appreciated by the students. Whatever may be thought of the ethics of trickery, or its effectiveness, the facts remain: that medicine is sometimes rather too self-sufficient, that dentistry, pharmacy, and nursing often introduce medicine into their fields in ways more rationalized than sound and for reasons better explained by the psychology of emotions than by the reasoned functions of these professions, and that an odd but necessary hybrid, public health, often connects everything, medical and otherwise, with health.

There is no reason that any meritorious professional group should step out of bounds or that any other should step into its field. To step out of bounds is to confess a feeling of inferiority or to seek power. These professions have no need to feel inferior; the able dentist is respected, but the dentist who tries to be what he is not loses respect except among the naive. As for seeking power, man is having trouble learning this lesson, but he must learn it or die. The place to develop balance and truth is in teaching, for this affects those who enter every profession.

True relationships connect all things; the watch runs when its cogs are integrated, not when they clash or one is silver-plated.

4. *Who shall teach?* Since the crux of teaching of preclinical subjects rests on teaching students rather than teaching the subjects, curricular organization is secondary. A subject could be defined as a mass of knowledge with a set of spangles attached, a rather dull set, the teachers, and a glittering but quite unstable set, the students. Though the route of subject to department to budget to glory is well-worn, it seems to me that the day has passed when this glorification of the *subject* is justified, though this calls for strengthening, not weakening, departmental lines. Knowledge is ethereal, all related, and never the same in two minds. It is divided into courses and subjects for convenience because time and man are finite and cannot encompass the whole adequately; the teacher and student are paramount and the subject is secondary.

The question of who shall teach preclinical subjects transcends the questions of what the subject shall be.

In a dental faculty meeting there was once a debate as to whether zoology or physics was the more important for entering students. Since many of the faculty had once flunked an unrealistic course in physics and had a vague idea that patients were zoologic specimens and that their own field was biologic, the argument strongly favored zoology. The Dean, in some scorn, following a speech which favored physics, said, approximately, "I wonder how many dentists think of force or acceleration when putting in a filling." Having seconded the speech which favored physics, I have always been sorry that someone did not say, "Let us hope that more dentists think of force than reflect on the anatomy of the pickled squid during this procedure." This is just one of the unnecessary and confused debates that fail to build on real issues.

At the extremes among the teachers of preclinical subjects can be found the archetypes. The academicians, vigorous, honest, and in their way correct in their claims that they have spent their lives in their fields, consider themselves best qualified to give fundamental training

in them. On the other hand, professional men, having had all the courses, academic and otherwise, often feel qualified to teach any subject along the way. A subdivision of this second group is composed of those who think that teachers should be professional men with special training, simply a combination of the archetypes.

These groups are vulnerable. Their weaknesses must be recognized if we are to find a realistic answer, for these are basically opposed ideas. A Dean cannot safely foster any single one of these policies; he is vulnerable if he accepts any. He can, however, seek an equilibrium and stand by that.

Beyond any doubt, the academic group is best prepared to present the basic stages of their subjects. The professional man has become such by combining fields. In a special field he is often a mere fritterer, a dealer in smatter, compared to the man who consecrates his life to the one subject. A lifetime is all too short really to acquire the feel of one subject. However, this strength, derived from consecration, is offset by a weakness in understanding of the professional fields, its manner of thought, and the connecting links. The basic man loses as the professional man gains in the argument, and this can be plotted along the progress of the course.

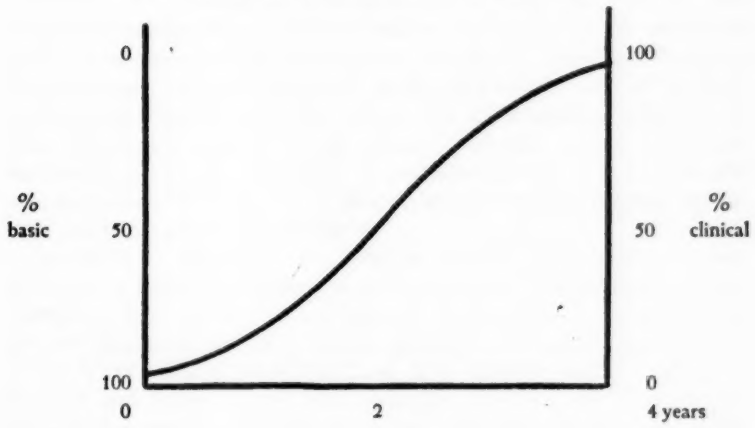
The professional man who will teach anything may be a hobbyist whose special knowledge and natural ability as a teacher make him ideal. This, however, is unusual. To point to such a man and say, "Let our teachers of preclinical subjects be clinically trained men who have special training in these subjects," is improper. The recognition of genius is by no means the same as knowledge of the formula for making it. Professional men in preclinical subjects may be clinicians who stress clinical links and belittle basic elements of preclinical subjects to students, which is almost as bad as giving these subjects more emphasis than they deserve, or they may be really specialists in a basic subject who have no genuine sympathy with their professions as such.

The scheme of having superteachers looks beautiful on paper. It seems to combine all the virtues. The fact is that man cannot take it. A D.D.S.-M.A. or some such combination does *not* insure the desired type, but only includes some of those with the desire, a point that administrators should think over. Teachers definitely must not be a group set apart, especially if they feel superior to their professional brethren and students. Teachers must be of the active scene. In this sense academicians of necessity have the virtue of some modesty, though it does not always show, since they lack professional training. If there is to be a superior

group, and the trend toward specialization is producing a snobbish exclusiveness, then the professional expert must assume the role, never the teacher.

Teaching of preclinical subjects can be carried toward clinical levels by the specialists in these fields, if they so will and so plan, after which it is the clinician's turn. This is delineated in Figure I, which makes it official. A student starts with basic knowledge, begins gradually to pick up clinical knowledge, accelerates to move quite rapidly toward that outlook, and tapers off to a study of essentially straight clinical work. The need for equilibrium at all times during the transitional shift clarifies the impropriety of much debate by indicating the places of the component factors.

FIG 1. BASIC AND CLINICAL LEARNING BY STUDENTS




The preclinical subject represents a change in position. To effect this students must begin with basic elements which are within their experience and move toward what will become their experience. If they dislike this initial stage, in their impatience, they must take it anyway. Good things require a preface. At all costs, let not the clinicians, as teachers, administrators, or advisors overrate or undercut the basic sciences. It is not easy to keep a student at basic work when he wants to peek over the fence into the clinic, and clinicians have been known to take advantage of this situation. Students will take any sort of clinical bait, of course, but an effective transition has meaning; let it be aided

by clinicians. Restraint, advice for patience, and a boost of morale are the clinicians' best contributions until it is time to take over.

An ideal teacher needs a lifetime of one way sincere experience in both his preclinical field and as a clinician, an impossibility. There are always compromises, like averages, but it is better to combine two persons. A department with a biochemist and also a true clinician interested in biochemistry (clinicians turned biochemists and biochemists turned clinicians are dangerous combinations but can occur) is in a good position to follow the curve. From that point how each subject is met is a problem for departmental teachers; it offers plenty of puzzles, but they are specific. The principles which are general and are so often idealistically argued, can be reduced to a straightforward planned equilibrium of smooth transition.

## CONFERENCE SESSIONS

# I. PEDODONTICS

## INTRODUCTION

GORDON H. ROVELSTAD, D.D.S.,[1] Chairman, *Chicago*

The theme of the American Association of Dental Schools 1953 Conference Session on Pedodontics was "Post Graduate Courses in Pedodontics." A summary of the session and the essays presented follow.

The conference opened with a report by Dr. Basil G. Bibby on student interest in postgraduate work, as determined by approximately a 50 per cent response to questionnaires circulated by him among senior dental students throughout the United States and Canada.

Of the 1387 questionnaires returned and summarized, 569 indicated an interest in specialized practice, and of this group, 58 per cent indicated pedodontics as their first choice and 60 per cent, second choice. Also, 763 indicated their interest in advanced training, whether by short or long-term courses. Of this group, 103 designated pedodontics as their first choice, and 32 second choice. Although only six indicated an interest in straight internships in pedodontics as a first interest and nine as a second interest, 323 indicated an interest in a rotating internship, including phases of pedodontics.

Dr. Philip E. Blackerby, Jr., enlarged on this by pointing out that there was a regional variation in percentages of student interest. For example, those questionnaires returned from Canada revealed a 10 per cent interest in pedodontics as a specialty, whereas the eastern part of the United States totaled a 2 per cent interest, south 3 per cent, midwest and Pacific 4 per cent. Probably of more pertinence to the topic of this session, however, he pointed out that 16 per cent of the total Canadian students responding were interested in advanced study in pedodontics. The students from the eastern part of the United States showed a 4 per cent interest, south 6.5 per cent, midwest 8.5 per cent and Pacific 14 per cent.

This report indicates that a sizable number of senior dental students are interested in this phase of dental practice and wish to become more proficient in it.

A second report presented a summary of another questionnaire circu-

[1]Assistant Professor of Pedodontics, The Dental School, Northwestern University.

lated by Dr. Ralph E. McDonald, vice-chairman, to all dental schools, in an effort to determine the availability of short courses in pedodontics to those students or dentists in practice who wish to enroll. With a 100 per cent response to the questionnaire (46 U. S. and Canadian dental schools) the following summary was presented.

Postgraduate (short) or refresher courses in pedodontics were being offered in 26 schools during 1953. Of the 20 not currently offering such courses, 16 indicated that they would at a later date. The type of course offered most frequently was the continuous type, one or two week courses without interruption. Twenty-four dental schools offered this type. Two dental schools offered interrupted courses of one day a week. Five of the 24 dental schools offering a continuous course also offered interrupted courses during the year, thus making a total of seven. Clinical practice was included within the course of 13 schools and three of the courses were subsidized by the state boards of health.

With an even distribution over the country there is certainly reason to believe that there is plenty of opportunity for those dentists who wish to do so, to obtain advanced training in pedodontics.

The subject of this conference session was centered on the content and organization of pedodontic refresher courses. The essayists were selected on the basis of their background and experience in the field of dental education and dentistry for children.

A lively discussion followed the presentation of the following essays. This centered around the course content and the need for follow-up courses upon completion of those already taken.

## POSTGRADUATE EDUCATION IN PEDODONTICS[1]

GEORGE W. TEUSCHER, D.D.S., M.S.D., Ph.D.,[2] *Chicago*

### Introduction

The burden of providing our children with dental care rests on the shoulders of the general practitioner. It is widely accepted that our children fail to receive adequate care and that something should be done to rectify this condition. The fault does not lie entirely with the members of the dental profession, but we can improve ourselves through further schooling.

There exists today three important ways by which dentists can be better educated in pedodontics. The first is to improve our undergraduate

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[1]Presented before the Conference Session on Pedodontics, American Association of Dental Schools' Meeting, Philadelphia, March, 1953.

[2]Professor of Pedodontics, The Dental School, Northwestern University.

programs: the dental schools hold the key to a better program of child care. They should develop and present programs of study which will acquaint the student with the problems of the growing child so that he may meet the child's dental problems in a context which he can understand. The second way is for the dentist to participate in a program of graduate education, leading to an advanced degree. An adequate graduate program can assure the further development of all the powers of the individual and help create a better individual and a better society. The third way to improve the pedodontic ability of the dentist is through the short postgraduate course. To the busy general practitioner, the latter method offers the best means of refreshing his knowledge and of improving it.

### Objectives of the Postgraduate Course in Pedodontics

The primary objective of the short postgraduate course is to help develop a dentist of superior ability in the care of the child patient. In order to know what the postgraduate course should offer, it is necessary to survey the needs of the general practitioner in his efforts to care for children. What are his most common problems? The postgraduate course should help him find the solutions.

1. *Behavior Patterns of the Patient.*

The majority of children are anxious to be cooperative. They will do more than their share to develop a working relationship with their dentist. However, it is important that the dentist should know how to maintain that cooperative spirit, and how to develop it in those children who do not display an initial willingness. It is in this area that the most deeply seated and most difficult of pedodontic problems exist. It is important that the dentist should be able to recognize a difficult psychological problem when he sees it and to know his own limitations in its solution.

There are two very potent influences in the life of a young child as far as the conditioning of his behavior is concerned.[8] The first influence is the parents. We cannot select a child's parents for him, but we can remember that parents are basically responsible for conditioning the success of a child in school, in the playground, and in his relationship with other people. The second influence is the community in which he lives. This matter is the concern of everyone and can be influenced by everyone. A community is likely to be good, if the people who live in it are good. A community is likely to be good, if the people who

[8]Hughes, J. M.: "Social Implications of Education," *J. Den. Educ.*, XI, 201-208; April, 1947.

inhabit it have good incomes. A community is likely to be good, if the people who live in it have good ability. Size of community and individual wealth do not necessarily promise good educational offerings for the children of the community. Lack of wealth, as revealed by the fact that families do not have adequate incomes, does usually promise poor community education.

To understand the impact of these influences on the child is tantamount to understanding the child himself. Even in a short postgraduate course, it is important that the matter at least be called to the attention of the dentist.

Paul Hill[4] says, "In contrast with adult emotions, children's emotions tend to be rather frequent and intense but quite brief and transitory. They are less likely to experience an emotional hang-over, but emotions previously experienced by direct stimulation may be aroused again by a portion of the original stimulus situation." Basic information such as the above is important for the dentist to understand, if his management of children is to be considered as scientific as the operative techniques which he employs. We probably do not spend enough time in helping the child adjust to a difficult situation; further, many unnecessary difficulties could be eliminated by paying more attention to the psychological needs of the child patient.

2. *Mental Hygiene for the Dentist.*

We speak of *behavior reactions* of the child; that is, reaction to *something or somebody*, resulting in a certain behavior response. The child patient certainly reacts to the dentist. The latter must give a great deal of attention to his own psychological problems and attitudes and solve them satisfactorily, if he hopes to work with children successfully.

3. *Operative Procedures for Children.*

The dentist should understand the differences between operating technique for children and for adults. He must provide treatment for the primary teeth in which certain morphological differences exist, and for the immature permanent teeth with large pulp chambers and incomplete root ends. Operating in these circumstances requires also a thorough knowledge of dental materials.

4. *Prosthetic Procedures for Children.*

The importance of prosthetic procedures for children is great. Percentagewise, the requirement probably is not as great as in the adult patient, but when appliances are indicated, they can play an important

[4]Hill, Paul J.: "The Emotional Development of the Child," J. Den. Educ., XI, 209-215; April, 1947.

role in the total treatment plan of the patient. It is not always easy to produce a well-fitting and well-functioning appliance for the child, and in addition to being basically well-grounded in prosthetic procedure, the dentist should recognize the role of the immature development of the patient in the development of a prosthetic appliance for his use.

5. *Pulp Therapy in Pedodontics.*

The root morphology of the primary molar teeth and the incomplete calcification of the roots of the young permanent teeth present problems of pulp management not found in the permanent teeth of adults. The modifications in treatment should be taught in short postgraduate courses so that the dentist is at ease when he faces these common clinical problems of the childhood period. In this category, too, there appear the important problems of the traumatized incisor tooth. No general postgraduate course in pedodontics could be considered complete without treatment of this important question.

6. *Anesthesia and Minor Oral Surgery.*

Anesthesia constitutes one of the most important fields of dentistry for the child's dentist. Both local and general anesthesia represent a scientific means to control the patient under otherwise difficult circumstances. However, to protect adequately both the patient and the operator, it is important that this subject be given sufficient attention in a postgraduate course. There are several groups of children, such as the cerebral palsied, the mentally retarded, the extremely uncooperative ones, and those with certain types of heart ailments, who are best managed under general anesthesia.

Because of the several minor problems of surgery which can arise from accidents to the child's dentition, from anomalies, from pulp involvements and from planned removal of teeth, such as in the treatment of certain malocclusions, the dentist should be acquainted with the anatomy of the parts involved, surgical techniques, the use of drugs for pre-medication and post-medication, and anesthesia.

7. *Growth and Development.*

The fact that the child is a growing organism makes him at once more complex and more interesting. It is extremely important that the child's dentist be informed in the problems of growth and development. He assumes an important responsibility for the health of the child when he accepts him as a patient. It is his job to ascertain, solve and treat the problems that arise in relation to the child's dental development. It is his job to direct him into the hands of specialists when they are

needed. On many occasions the child's dentist is called upon to help solve problems of nutrition, malocclusion, psychology and speech therapy. Along with a knowledge of diagnosis, treatment planning and treatment technics, an understanding of growth and development will prove essential in answering these important questions.

8. *Caries Control: Diet and Nutrition.*

The preventive aspects of child dental care should occupy a dominating position in the postgraduate program. There are several positive measures which can be adopted today to control dental caries. The postgraduate dentist should have some understanding of the mechanism of dental caries, the role of oral bacteria in mouth health, and the importance of oral hygiene on the health of the teeth and their supporting tissues. He should know something about the employment of a valid salivary activity test in the determination of caries susceptibility.

Granted that diet and nutrition is a field requiring a great deal of study in order that it can be understood properly, it is imperative, nevertheless, that the child's dentist should understand at least its essential elements. It is hard to conceive of him as a well-trained individual unless he does have that understanding. With this combined knowledge, he is in good position to utilize intelligently the known technics of caries control.

## Conclusion

To the gentlemen who follow me I must leave the presentation of how these materials can be brought adequately to the postgraduate student in a program covering but a short period of time. Doctors Easlick and Addelston have had extensive experience in the development and presentation of this type of program. It is no easy matter to include in a short course all the materials, recognized as essential in the education of a child's dentist. I believe you will listen with interest to the excellent programs which these men have developed.

My own effort here has been only to discuss what seem to be the more essential areas of pedodontic practice and therefore the most essential aspects of a postgraduate course in pedodontics. It seems to me that the short postgraduate course in pedodontics brings within the reach of a large majority of general practitioners a practical way of improving themselves in the management of pedodontic problems. It is my opinion that more schools should study the possibility of presenting such courses and thus to aid further the advancement of child dental care in this country.

# THE UNIVERSITY OF MICHIGAN'S POSTGRADUATE COURSES IN PEDODONTICS—PURPOSE AND PLAN[1]

KENNETH A. EASLICK, A.M., D.D.S.,[2] *Ann Arbor*

Regardless of the level of the course to be presented, whether it be undergraduate, short postgraduate, resident postgraduate or graduate (leading to a degree), it appears to be a sensible purpose that this experience in professional training be planned, within time limitations, to expose the student as completely as possible to the various knowledges and skills which he will need (difficult orthodontic and surgical treatment omitted) to diagnose and treat any oral condition detected during childhood. The objective always is to develop a dentist with ability to provide superior general practice for child patients. Furthermore, patients reasonably may be classed as child patients during the periods of the primary, mixed and young adult dentitions—patients who are treated until such time as a satisfactory status of permanent occlusion and supporting tissues has been achieved.

The University of Michigan has experimented with a number of postgraduate programs since its first two-week course in 1937, in addition to its two-week program, a program of one day a week at the Kellogg Institute throughout the semester, a program of one day a week in an extramural extension center, a solid block program with other specialty programs in a general postgraduate review, and a full-time, two-semester program for dentists in residence at the University who are not candidates for graduate degrees. Some experience has been gained with all of these programs but the most extensive experience has been gained with the two-week program which, for the last several years has been offered during three different periods each school year. The pattern of this course will be presented in some detail later in this paper.

First, it should be stated that, for the past five years, the recommendations of the American Board of Pedodontics[3] have served as a guide to the experiences which should be incorporated in a postgraduate program. This board expects a candidate for certification as a specialist to be qualified in seven areas of practice for young patients. They follow:

1. *Management of Behavior.*

Competence is expected in the guidance of the child dental patient's behavior and the child-parent relationship during the appointment. Until

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[1]Presented before the Conference Session on Pedodontics, American Association of Dental Schools' Meeting, Philadelphia, March, 1953.

[2]Professor of Dentistry (Pedodontics), School of Dentistry, University of Michigan.

[3]Approved, Feb. 8, 1948.

both types of guidance can be mobilized, satisfactory oral treatment usually is impossible.

2. *Operative and Prosthodontic Procedures for the Dentitions Involved.* Inasmuch as the well-trained children's operator must provide treatment for the primary teeth in which certain variations from adult teeth exist in structure, in morphology of pulpal chambers, root canals and root apices and in external morphological contours of crowns, as well as for immature permanent teeth with large pulpal chambers, incompleted root-ends and extensive collars of gingival tissue, a thorough knowledge, both of the teeth and of scientific technics of preparing cavities for restorations of carious or traumatized crowns, is demanded. Some children also require the construction of removable dentures; a few need complete dentures; another small group requires special appliances for the habilitation of palatal clefts; and, not infrequently, a young permanent dentition requires an anterior bridge. Typical problems which maintain in adult restorative and prosthetic dentistry are enhanced by the immature development of the patient and, hence, demand mastery of skillful and precise restorative technics planned after consideration of additional complications in diagnosis, and planned for an appreciably longer period of service.

3. *Knowledge of and Skill in the Manipulation of Dental Materials.* To rule out empiricism in the selection of materials and to assure clinical manipulation of restorative and appliance materials which enhances their longevity and resistance to stresses, along with due consideration for conservation of the dental pulp and dental supporting tissues, thorough study of and experience with dental materials is required. One of the earlier hindrances to adequate restorative dentistry for children was failure to appreciate the value of scientific materials.

4. *Anesthesia, Extractions, and Minor Oral Surgery.* Certain minor problems of surgery arise from accidents to the young dentition, from developing dental anomalies and growths involving the soft tissues, from irregularity in the exchange of dentitions, from removal of teeth as a part of planned orthodontic treatment, from exposed pulps which lead to extractions or root surgery, and from the treatment required for mentally deficient, palsied and hospitalized children. These conditions, certainly when they arise during the periods of the primary and mixed dentitions, demand some specialized study of anatomy and training in surgical technics and surgery-room conduct, the use of instruments and scientific utilization of pre-medication, post-medication, anesthetics and anesthesia.

*5. Root Surgery and Therapy for Teeth with Involved Pulps.*

The bizarre morphology of the roots of the primary molars and the incomplete calcification of the root-ends of young permanent teeth have created problems of pulpal management not encountered in the older permanent dentition and have, therefore, necessitated the development of modifications of operative technics used for the management of pulp-involved adult teeth. The problem of providing treatment of pulpal conditions in young dentitions is complicated further by the frequency of damage to incisors by accidents during the earlier years of life. Coronal fractures, coronal discoloration, fractured roots, displaced teeth and teeth completely retruded or removed, all have to be treated in a manner acceptable to the modern endodontist who is utilizing radiologic and bacteriologic controls.

*6. Problems of Growth, Development and Health During Childhood.*

The children's dentist, when he undertakes the oral health protection of a young patient, assumes a definite responsibility for the dental contribution to the health of this patient and accepts the task seriously of supervising the development and exchange of dentitions in a growing and developing human organism. Likewise, he accepts the responsibility for referral of this patient to the orthodontist, oral surgeon, pediatrician, speech therapist, psychologist or nutritionist as the services of these specialists are required. The discharge of responsibility in this area of dental practice requires a thorough training in diagnosis and a limited number of technics of treatment, along with an understanding of child growth and development at least equal to that of the orthodontist.

For purposes of discussion, this area of qualification may be divided into a series of concrete activities in which the children's dentist is expected to achieve competence. They follow:

1. Preventive and palliative orthodontic treatment;
2. Detection and treatment or interception of dental anomalies which involve the number, morphology, structure or position of individual teeth;
3. Physical appraisal of the status of children and provision of dental care for sick and handicapped children; and
4. Complete oral contribution to the speech habilitation, masticatory function and appearance of children with operated or neglected oral clefts.

*7. Dental Health Guidance.*

For the dental health guidance of his patients and for the information of parents, the pedodontist requires critically appraised scientific information about nutrition, the development of teeth, the effect of mineral and vitamin metabolism on the teeth and other oral structures, home care of the supporting tissues, interference with oral habits, oral bac-

teriology and the mechanism of caries, tests for caries activity and the utilization of technics for control of caries.

Granted that the teacher of pedodontics accepts as sound the recommendations of the American Board of Pedodontics, then he is confronted by the problem of developing the student's qualification in these seven areas of activity just as far as he can in the time that is allotted for the postgraduate course. Once a decision regarding the extent of coverage has been made, then a second decision has to be made regarding the manner of presentation. Should information and technics be presented by clinical operating on patients, by operating on typodonts, by staff demonstrations, by formal staff lectures, by staff seminars, by the addition of lecturers outside the departmental staff (perhaps even from other university disciplines than dentistry), or by a fortuitous combination of all these technics of approach? Further, having decided the manner of presentation, a decision has to be made about the proper balance of operating, laboratory, demonstration and lecture periods. Finally comes the task of making a schedule of participation which provides a suitable balance of periods and an acceptable utilization of the time of a variety of instructors without undue interference with their regular assigned tasks. One other task always has to be anticipated by the coordinator of such a course, the thorough "briefing" of the participating instructors so that each knows precisely the extent and purpose of his assignment.

The experience of the staff at the University of Michigan would indicate that the coordinated approach to a short postgraduate course is sound educationally and that lecture, demonstration and clinical performance all are helpful to assure comprehension in students and a reasonable attainment of skill with new technics. A notebook, pocket flashlight (for taking notes in a darkened room), duplicated technical outlines, children's and adult typodonts to be used in the dental chair attached to a rod-like appliance which replaces the head-rest, clinical supplies, an operating kit of non-perishable instruments and a locker are furnished for the postgraduate dentist and are covered by his tuition. Housing is arranged at the students' center on the Campus.

The established pattern of the two-week course now will be presented, but, with the caution that no two courses, over a period of years, are apt to be a complete repetition in material, approach, personnel or sequence of scheduling. A sample of the two-week postgraduate course follows:

## W. K. KELLOGG FOUNDATION INSTITUTE: GRADUATE AND POSTGRADUATE DENTISTRY

Two-Week Postgraduate Course

### DENTISTRY FOR CHILDREN

December 1-12, 1952

*Monday, December 1*

8:30- 9:00—Registration.
9:00-12:00—Lecture: Organization of Course and Routine in Children's Clinic.
1:00- 3:00—Lecture: How Children Grow.
3:00- 5:00—Lecture: Psychologic Technics in the Management of Children.

*Tuesday, December 2*

8:30-10:00—Lecture: Radiographic Technics in a Children's Practice.
10:00-11:30—Demonstration and Lecture:
1. Securing Dietary History and Placing Child on Low Carbohydrate Diet.
2. Adequate Diet for Growing Children and Pregnant Women.

11:30-12:00—Laboratory Demonstration: Securing and Preparing Saliva Samples.
1:00- 3:00—Lecture: Pre-appointment Considerations: Orientation of the Child, Dental Office and Dentist for a Productive Appointment.
3:00- 5:00—Lecture: An Evaluation of Control Measures for Dental Caries.

*Wednesday, December 3*

8:30-10:00—Lecture: The Morphology of the Primary Teeth—Its Relationship to the Preparation of Cavities.
10:00-12:00—Lecture: The Child Patient's First Appointment.
1:30- 3:00—Lecture: Physical Properties and Clinical Manipulation of Silver Amalgam.
3:00- 5:00—Lecture: Preparation of Cavities and Restoration of Primary Teeth.

*Thursday, December 4*

8:00-10:30—Children's Clinic: Operating by Students:
1. Checking out Instruments and Assignment of Chairs.
2. Preparation of Cavity and Sectioning Large Primary Molar (Plaster Model).

10:30-12:00— 3. Preparation of Cavities and Filling Primary Teeth of Manikin (Class I, II, IV, and Proximal Spot).

1:00- 3:00—Lecture: Operative Procedures for Young Permanent Teeth.
3:00- 5:00—Lecture: Dental Cements and Resins—Their Physical Properties and Clinical Manipulation.

*Friday, December 5*

8:30-10:30—Children's Clinic: Operating by Students:
Introductory Appointments with Child Patients Including Topical Application of Sodium Fluoride.
10:30-12:00—Lecture: The Etiology and Diagnosis of Malocclusion.
1:00- 3:00—Lecture: Restorations for Young Fractured Incisors.
3:00- 5:00—Lecture: Management of Pulpal Conditions in Young Molars.

*Saturday, December 6*

8:30-10:30—Lecture: Developmental and Nutritional Disturbances of the Dentitions.
10:30-12:00—Lecture: Management of Pulpal Conditions Arising When Incisors Are Involved in Accidents.

*Monday, December 8*

8:30- 9:30—Children's Clinic:
1. Demonstration of Preparation of Manikin Fractured Permanent Incisor.

9:30-11:00— 2. Operating by Students: Fractured Incisor Preparation, Impression and Wax Bite—Manikin Teeth.

11:00-12:00— 3. Filling Patient's Primary Molars and Cuspids.

1:00- 3:00—Lecture: Technics of Maxillary Local Anesthesia.

3:00- 4:30—Lecture: Office Organization in a Practice for Children.

4:30- 5:00—Laboratory Period: Articulation of Dies for Three-Quarter Crown.

*Tuesday, December 9*

8:30—10:00—Children's Clinic: Operating by Students:
1. Filling Buccal Pit of Permanent Molar of Manikin Tooth with Mat Gold—Gold Foil.

10:00-11:00— 2. Completion and Polishing of Fillings in Manikin Teeth.

11:00-12:00—Laboratory Demonstration: Counting the Colonies of Lactobacilli.

1:00- 3:00—Lecture-Demonstration with Patient: Procedures in Radiography for Children.

3:00- 5:00—Radiological Diagnosis During Childhood.

*Wednesday, December 10*

8:30-10:30—Children's Clinic—Laboratory:
1. Waxing Restoration for Fractured Incisor. Inserting Silicate for Fractured Incisor.

10:30-12:00— 2. Restorations of Patient's Primary Cuspids and Molars with Amalgam.

1:00- 3:00—Lecture: Problems in the Management of Premature Spaces During the Periods of Primary and Mixed Dentitions.

3:00- 5:00—Lecture: Preparation of Child Patient and Dentist for Operative Treatment.

*Thursday, December 11*

8:30-10:00—Children's Clinic:
1. Laboratory: Preparation of Dies for Fractured Incisor.

10:00-11:00— 2. Operating by Students: Polishing Fillings.

11:00-12:00—Lecture: The Detection and Treatment of Dental Anomalies I.

1:00- 3:00—Lecture: The Behavior of Preschool Children.

3:00- 5:00—Lecture: Technics of Mandibular Local Anesthesia and Demonstration of Anesthesia and Extractions.

7:00 Bluebook Examination.

*Friday, December 12*

8:30-10:30—Children's Clinic: Student Operating: Performing Partial Pulpectomies in Primary and Young Permanent Teeth of Patients.

10:30-12:00—Lecture-Demonstration: Technics Available to the Children's Dentist for Intercepting Malocclusion.

1:00- 1:30—Checking and Returning Instruments.

1:30- 4:00—Lecture: The Detection and Treatment of Dental Anomalies II.

An examination of this program will show that the first three days are occupied in main by lectures, and hence provide little variety in approach. The balance in hours devoted to lecture, demonstration, and operating or laboratory procedures also may be of some interest. The sample program devotes 52 hours to lecturing, 5½ hours to demonstrations and 19½ hours to operating or laboratory work for a total of 77 hours. (Table I.) When this program is studied from the stand-

TABLE I—DISTRIBUTION OF HOURS: TEACHING APPROACH

| Date | Lecture | Demonstration | Operating or Laboratory Procedures | Total |
|---|---|---|---|---|
| Mon. 1 | 7.0 | ... | ... | 7.0 |
| Tues. 2 | 6.0 | 1.5 | ... | 7.5 |
| Wed. 3 | 7.5 | ... | ... | 7.5 |
| Thurs. 4 | 4.0 | ... | 4.0 | 8.0 |
| Fri. 5 | 5.5 | ... | 2.0 | 7.5 |
| Sat. 6 | 3.5 | ... | ... | 3.5 |
| Mon. 8 | 3.5 | 1.0 | 3.0 | 7.5 |
| Tues. 9 | 3.0 | 2.0 | 2.5 | 7.5 |
| Wed. 10 | 4.0 | ... | 2.5 | 7.5 |
| Thurs. 11 | 4.0 | 1.0 | 2.5 | 7.5 |
| Fri. 12 | 4.0 | ... | 2.0 | 6.0 |
| Total | 52.0 | 5.5 | 19.5 | 77.0 |

point of hours devoted to the seven areas of achievement, it will be found that 14½ hours are devoted to patient and office management, 31½ hours to restorative and diagnostic procedures, four hours to dental materials, four hours to anesthesia and surgery, 5½ hours to pulpal management, 10½ hours to health, growth and developmental problems, and seven hours to dental health guidance. (Table II.)

TABLE II—DISTRIBUTION OF HOURS: AREA COVERED

| Date | Behavior and Office Management | Diagnostic and Reconstructive Clinical Procedures | Dental Materials | Anesthesia Surgery | Root Surgery | Health, Growth, Development | Dental Health Guidance |
|---|---|---|---|---|---|---|---|
| Mon. 1 | 5.0 | ... | ... | ... | ... | 2.0 | ... |
| Tues. 2 | 2.0 | 1.5 | ... | ... | ... | ... | 4.0 |
| Wed. 3 | 2.0 | 3.5 | 2.0 | ... | ... | ... | ... |
| Thurs. 4 | ... | 6.0 | 2.0 | ... | ... | ... | ... |
| Fri. 5 | ... | 4.0 | ... | ... | 2.0 | 1.5 | ... |
| Sat. 6 | ... | ... | ... | ... | 1.5 | ... | 2.0 |
| Mon. 8 | 1.5 | 4.0 | ... | 2.0 | ... | ... | ... |
| Tues. 9 | ... | 6.5 | ... | ... | ... | ... | 1.0 |
| Wed. 10 | 2.0 | 3.5 | ... | ... | ... | 2.0 | ... |
| Thurs. 11 | 2.0 | 2.5 | ... | 2.0 | ... | 1.0 | ... |
| Fri. 12 | ... | ... | ... | ... | 2.0 | 4.0 | ... |
| Total | 14.5 | 31.5 | 4.0 | 4.0 | 5.5 | 10.5 | 7.0 |

Since the staff members are not completely satisfied with the present program, it may be expected that the customary valuation which follows the completion of each course will lead to a number of changes in this pattern for the future.

## POSTGRADUATE COURSES IN PEDODONTICS AT NEW YORK UNIVERSITY[1]

HAROLD KANE ADDELSTON, D.D.S.,[2] *New York*

In New York, as probably elsewhere, the motivation to present postgraduate courses in pedodontics, as well as in other subjects, came from several sources. On the one hand, there was the desire of practicing dentists to improve their potential capacity to care for child patients, with all the concomitant benefits; on the other hand, the realization of dental educators that the average general practitioner of dentistry needed further training in dentistry for children. Some younger dentists had had some training in pedodontics in their undergraduate course, differing in quantity and quality, depending upon the school they had attended, and upon the year they had graduated. Older men had usually had little, if any, formal training in this field; some had acquired some degree of self training. Therefore, it was deemed necessary to provide courses that would satisfy the needs of different individuals, and various groups.

Our primary concern, in New York and the vicinity, has been to train dentists to do routine dentistry for children as part of the general practice of dentistry. For several reasons, courses leading to graduate degrees, and possibly to specialization, have not been included in the curriculum at the college.

With these thoughts in mind, several different types of so-called postgraduate and refresher courses in pedodontics were designed and offered by the department. Samples of some of these courses will be described.

### Short Courses

1. These were given in a series of four or six lectures of two hours duration each, covering one or more specific phases of dentistry for children, such as: child patient management; pulp treatment of primary teeth; cavity preparation for primary teeth; cast restorations for primary teeth; space maintenance, etc.

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[1]Presented before the Conference Session on Pedodontics, American Association of Dental Schools' Meeting, Philadelphia, March, 1953.

[2]Associate Professor of Pedodontics, New York University, College of Dentistry.

These courses were sometimes well attended. They seemed to be what the dentists wanted, or thought they wanted. However, the teaching staff had the very definite impression that all too frequently these didactic presentations served to salve the consciences of the participants, but did not serve to improve their technics appreciably. They have been discontinued.

2. Refresher courses, consisting of a series of lectures and demonstrations of various pedodontic technics in eight weekly three-hour sessions, have been given. In some of these courses the members of the class performed some of the operations on typodonts in the laboratory. In one such course, the laboratory periods were devoted to the development of modified cavity preparations for cast gold restorations for primary teeth, and the construction of cast gold space maintainers.

It has been observed that although this kind of instruction may have trained some of the participants in specific areas of practice, it did not succeed so well in giving the student an adequate grasp of the scope of pedodontics in a general practice. While it may be true that some of these students learned something, or some part of dentistry for children, and that many of them were stimulated to continue their training in this field, some were left floundering, unable to cope with the problems that so frequently accompany children to the dental office.

3. Another type of refresher course in pedodontics has been given by that department of the college, under the sponsorship of the Bureau of Dental Health, of the New York State Department of Health. This has been presented as a two-week, full-time, "in residence" course, and was designed to accommodate dentists who practice at some distance from the university centers. The bureau selected and subsidized the students for these courses as part of their program to improve the quality of dentistry provided for children in the state. A sample of the schedule of this course is presented in Table 1. (See page 99.) It may be observed, that although some background material such as the lectures on anatomy, morphology, histology, growth and development, etc., is presented to the class, the accent of the course is on the improvement of the clinical technics. The students practice on typodonts in the laboratory, and on patients in the college infirmary.

During the laboratory and clinical sessions a large number of instructors are on hand to ensure practically individual instruction, demonstration and supervision. The technics stressed in this course are: parent education, patient training, radiography, impressions for study casts, examinations, cavity preparation and restoration, pulp protection and

treatment, and space maintenance. The instructors make a point of discussing the diagnosis and treatment planning of each case used for either demonstration or student practice. It may be worth noting that the teaching staff find this course stimulating, though tiring, since a real effort is made to concentrate a large quantity of positive teaching into a relatively small amount of time.

It is gratifying to comment that Dr. David Ast, Director of the State Bureau of Dental Health, reports to us that the dentists who have participated in these courses have given evidence of improved quality of dental service to children. New York State continues to sponsor and subsidize these special refresher courses.

### Long Course

The department offers, in addition, a longer course, of 35 weekly three-hour sessions, in which the students have an opportunity to practice the technics taught didactically, both on typodonts, and on child patients. This 105-hour course, given every Wednesday afternoon for 35 weeks, includes lectures, seminars, individual conferences, laboratory exercises, clinical practice and field trips to service clinics such as the Guggenheim Clinic, and to Newburgh, New York, to inspect the fluoridation experiment. The syllabus for this course includes the topics listed in Table 2. (See page 100.) During this course the students work on typodonts in the laboratory, doing exercises in cavity preparation for plastic fillings, and for cast restorations for primary teeth, and constructing cast space maintainers. The clinical practice sessions were organized so as to give the students opportunity to put into practice, under supervision, the theories and technics which had been expounded in the lecture series, and tried in the laboratory.

Each student is assigned several child patients for whose complete dental care he is responsible. The students are told that the instructors will supervise all their efforts, and will use the highest criteria in determining, with the student, whether or not the quality of the work, and the approach, and method, indicate a proper understanding of the particular problem, and a reasonable capacity to perform the technic, operation, or phase of the work. Instructors assigned to the course are carefully trained not only in the subject matter but also in methods of guiding postgraduate students. A minimum ratio of one teacher to every three students is maintained during all the laboratory and clinical sessions.

All this is carefully explained to each applicant for the course. Any

applicant who is not prepared to accept such a regimen is discouraged from participation. In a few instances it has been necessary to suggest the withdrawal of students who have given evidence of a lack of earnestness in this endeavor.

A clarification of the phrase "complete care of the child patient" is indicated here. The patients are selected on the following basis:

1. Presentation of a "management" problem.
2. Presentation of a problem in diagnosis.
3. Presentation of a variety of treatment required.

The rationale for this is that the student would not benefit sufficiently from practicing on a previously well trained dental patient, or on one for whom the diagnosis and treatment plan is obvious, or on one who requires only the simplest type of dental care. When a student is introduced to his patient he is expected to educate the parents concerning the goals of good dentistry for children, as well as to their part in the effort to attain good dental health for their child. He is then to train each patient to accept dentistry. It needs to be stated that particularly in this phase, instructor guidance of the student is critical. Each student then carries his group of child patients (one by one, of course), through a complete examination, including bite-wing as well as periapical radiographs, impressions for study casts, diet survey, medical and previous dental history, clinical examination, and any other diagnostic aids deemed important to an evaluation of the case.

Each diagnosis and treatment plan is discussed thoroughly by an instructor with the individual student, and then with the entire group. This affords each student the opportunity to observe many more cases than he could carry himself. When a sound treatment plan has been established the student then performs all the necessary dental treatment required. The distribution of patients usually gives each student the opportunity to practice the following procedures, in addition to the examination: prophylaxis, tooth brush instruction and drill, cavity preparation and restoration with plastic filling materials (silver amalgam, silicates, acrylic resins), cast gold restorations (both inlay and full crown), cast gold fixed space maintainers, removable acrylic space maintaining appliances (not all students), pulpotomy, anesthesia, and sodium fluoride topical applications.

There are demonstrations of the treatment and restoration of injured anterior teeth, partial and full denture construction, as occasion permits.

## Summary

Our experience, in New York, has been that the most satisfactory course for our purpose is the long course. Our motive has been to train dentists to do adequate routine dentistry for children. During the long course, the participants have had presented to them in didactic manner, quite some material relevant to this phase of dentistry, have had the opportunity to observe a number of child patients, have practiced some of the more frequently utilized technics on typodonts, and have had the opportunity to practice on child patients under supervision. They have followed several patients through complete dental care, and have been able, during this extended period of time, to bring their private office problems to the staff for consultation and advice. They have seen the end results, to some extent, of the complete dental care of children.

We are impressed with the values to be derived from this extended time period of the course. The students are able to assimilate the material presented; they have time to think about the ideas expressed; they have opportunity to observe the results of their work; they see the problems that confront them when they attempt to practice what they have learned; there is time for them to review their efforts with the staff; there is time to review, to question, to think, to evaluate, and to synthesize their perhaps newly acquired knowledge in the light of their own experiences. We have learned much from them and from their reactions!

In retrospect, we are made aware of the relatively short period of time over which we have had experience in postgraduate pedodontic education. We have observed, with some mind and soul searching, the degree to which we have been making changes in our courses in an effort to supply the need.

We can but hope, that our own experience, together with the experiences of others, as related here in this session, and elsewhere, will teach us to continue to improve our own syllabus and methods, to the end that more dentists will provide more and better dentistry for children.

TABLE 1

## NEW YORK UNIVERSITY COLLEGE OF DENTISTRY
## SPECIAL REFRESHER COURSE IN PEDODONTICS

June, 1952

Sponsored by Bureau of Dental Health,
Department of Health, State of New York

### SCHEDULE

*Monday, June 9*

9:00 A.M.—Registration
10:00 A.M.—Introduction and Orientation ..... 2 Hours
1:00 P.M.—Anatomy of Jaws and Dental Structures of Child ..... 1 Hour
2:00 P.M.—Histology of Teeth and Supporting Structures of Child ..... 1 Hour
3:00 P.M.—Morphology of Primary Teeth ..... 1 Hour

*Tuesday, June 10*

9:00 A.M.—Caries: Etiology, Prevention, Control ..... 3 Hours
1:00 P.M.—Cavity Preparation and Prophylactic Odontotomy ..... 2 Hours
3:00 P.M.—Use of Matrices ..... 1 Hour

*Wednesday, June 11*

9:00 A.M.—Cast Restorations for Children ..... 1 Hour
10:00 A.M.—Acrylic Restorations for Children ..... 2 Hours
1:00 P.M.—Growth and Development of the Child's Dentition ..... 3 Hours

*Thursday, June 12*

9:00 A.M.—Space Maintenance: Theory and Practice ..... 3 Hours
1:00 P.M.—Laboratory Demonstration and Practice on Typodonts:
Cavity Preparation for Amalgam, Acrylic, Cast Restorations
and Space Maintainers ..... 3 Hours

*Friday, June 13*

9:00 A.M.—Radiographic Technic and Interpretation ..... 2 Hours
11:00 A.M.—Local Anesthesia for Children ..... 1 Hour
1:00 P.M.—Laboratory Exercises continued ..... 3 Hours

*Monday, June 16*

9:00 A.M.—Parent Education and Child Patient Training ..... 2 Hours
11:00 A.M.—Practical Use of Audio-Visual Aids in Parent and Patient
Education ..... 1 Hour
1:00 P.M.—Clinical Demonstration and Practice ..... 3 Hours

*Tuesday, June 17*

9:00 A.M.—Dental Examination of Child Patient, Diagnosis, Treatment
Planning, Records ..... 3 Hours
1:00 P.M.—Clinical Demonstration and Practice ..... 3 Hours

*Wednesday, June 18*

9:00 A.M.—Treatment of Pulps of Children's Teeth ..... 2 Hours
11:00 A.M.—Treatment of Fractured Teeth ..... 1 Hour
1:00 P.M.—Clinical Demonstrations and Practice ..... 3 Hours

*Thursday, June 19*

9:00 A.M.—Diet Survey and Guidance ..... 1 Hour
10:00 A.M.—Health Education Follow-Up Methods in School Health Programs 2 Hours
1:00 P.M.—Clinical Demonstration and Practice ..... 3 Hours

*Friday, June 20*

9:00 A.M.—Seminar and Résumé of Course..... 3 Hours
1:00 P.M.—Clinical Demonstration and Practice..... 3 Hours

TABLE 2

NEW YORK UNIVERSITY COLLEGE OF DENTISTRY
DEPARTMENT OF PEDODONTICS—POSTGRADUATE

*Subjects Presented in Lecture Series—Long Course.*

Orientation and Presentation of Outline and Scope of Course.
Development of an Attitude Concerning Dentistry for Children.
Growth and Development of the Jaws and Teeth.
Anatomy: Morphology of the Primary Teeth.
Histology: Review of Microscopic Anatomy of Teeth and Supporting Structures.
Parent Education.
Patient Training.
Examination, Diagnosis and Treatment Planning.
Radiography: Technic and Interpretation.
Full Mouth Impressions and Study Casts.
Oral Diseases of Childhood.
Diseases of Childhood.
Caries: Etiology, Prevention and Control.
Prophylactic Odontotomy.
Cavity Preparation, and Matrices for Primary Teeth.
Plastic Restorations for Primary Teeth.
Modified Cast Gold Restorations for Primary Teeth.
Space Maintenance.
Nutrition.
Public Health Aspects of Pedodontics.
Fluoridation: Topical and Water Supply. (Inspection of Newburgh Experiment.)
Protection and Treatment of Pulps of Primary and Immature Permanent Teeth.
Local Anesthesia and Minor Oral Surgery.
Partial and Full Dentures for Children.
Habits.
Psychosomatics in Dentistry for Children.

*Technics Practiced on Typodonts in Laboratory.*

Cavity Preparation.
Plastic Fillings.
Modified Cast Gold Restorations.
Space Maintainers.

*Special Demonstrations and Practice.*

Treatment of Fractures of Teeth.
Partial and Full Dentures.

# II. ORAL SURGERY

*(While the theme of the following three papers is, "The Preparation and Scoring of Written Examinations in Oral Surgery," they are, nevertheless, applicable to other dental courses.—Ed.)*

## WRITTEN EXAMINATIONS[1]

LLOYD E. BLAUCH, Ph.D.,[2] *Washington, D. C.*

Let me begin this paper by observing that the examination function of the teacher is in some respects the most uncertain and difficult thing he has to do. That may sound strange indeed, but teachers who have considered the matter seriously will recognize it as a fact. We give many examinations, but seldom do we look at our examinations critically and in the light of the educational process. When we do that, we are likely to become quite frustrated because we fall so far short of our ideal.

Let me say also that the giving of examinations is an activity that is often greatly disliked, for four main reasons: First, at times we are frustrated by our failure to measure adequately the accomplishment of the student; second, if it is well done it requires a great deal of time and effort in doing something that is to many of us quite uninteresting; third, there is no way of evaluating the attainment of students without the use of a certain amount of subjective judgment; and, finally, the giving of examinations involves passing judgment on people, on one's friends.

Examinations given by a teacher may have several purposes, all of them useful. First, they show the student what learning he has accomplished and where his weaknesses and shortcomings lie. Second, they help the teacher to get a judgment concerning the student's attainment. And third, they assist the teacher in assigning to the student a grade of achievement. For both the student and the teacher, examinations have great value—more, I suspect, than we realize. I am quite satisfied that we teach too much and examine too little. If the results of examinations are carefully reviewed by the teacher with his class they become a means of considerable enlightenment to students—and likewise to the teacher. Their use tends to emphasize the responsibility of the student for his education.

I need hardly remind you that an examination should be an effort

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[1]Presented before the Conference Session on Oral Surgery, American Association of Dental Schools' Meeting, Philadelphia, March, 1953.

[2]Chief for Education in the Health Professions, Office of Education, Department of Health, Education and Welfare.

to discover whether students have accomplished the objectives set for them. That being the case, the examination questions should be definitely based upon the stated objectives of instruction in the course. All too often we note that the questions serve no particular purpose other than to sample the student's information.

The examination, like every other phase of the teacher's work, should be planned and carried out with great care. The preparation of sound examination questions is not an activity for an amateur. In doing it there is much at stake, both from the point of view of sound education as well as from the point of view of justice to students.

In recent years test experts have developed an extensive set of ideas and principles regarding examinations. Today no teacher need be uninformed about good practices in the examination function. An excellent treatise on the subject is a book edited by Professor E. F. Lindquist and titled *Educational Measurement* (American Council on Education, 1951). Recently the American Dental Association has published a 63-page *Manual on the Preparation of Examinations in the Field of Dentistry* by Shailer Peterson. The study of these works will save the teacher from many a headache.

So much by way of a lengthy introduction. Now for some observations about examinations.

## Selecting the Subject Matter for Questions

The first step one has to take in preparing examination questions is to select the subject matter for the questions; that is, he must decide upon the ideas, principles, facts, and procedures he will use in the questions. The choice of the items to be used depends, of course, upon the objectives of the course and upon what the teacher wants to find out about the student.

I am certain you know that to make up a list of items to be used in an examination is no small undertaking. It need not, however, be too difficult a task if the teacher will exercise a little ingenuity and will devote the necessary time to the task. How can he proceed? First, he can study the outline of his course, noting the essential ideas, facts, and procedures the student should have acquired.

Once a list of the significant items has been prepared, the teacher must select from them those that best serve his purposes. No doubt you have seen many examinations that consisted of a mere selection at random of any ideas, facts, and procedures that came into the teacher's mind as he made up his questions; the questions were not aimed at

accomplishing a particular purpose or purposes. Surely such a hit-or-miss practice is not defensible.

In selecting the items to be incorporated in the examination the teacher needs to ask himself the question: "Just what am I trying to find out? And what do I want the student to find out about himself? Is the purpose to discover whether the student has memorized a body of information, or is it to find out whether he has so incorporated it in his thinking that he can use it or do something with it? Is it enough that the examination measures the possession of knowledge and skill or should it reveal also the ability to apply knowledge to the solution of problems?"

The first step, then, in making up an examination intelligently is for the teacher to list the ideas, facts, and procedures on which he will base the examination. As he makes up such a list he should keep clearly in mind the purposes the examination is to serve.

## Constructing the Questions

Once the teacher has selected the items to be included, he has to construct the questions. I am sure you recognize that there is no entirely satisfactory classification of examination questions, but for our purposes we may speak of two general types.

1. Essay questions, known also as free-answer questions, traditional type questions, subjective questions. The answers to these questions are usually in the form of one or more complete sentences; in some cases in the form of outlines. In a broad sense, an essay question may be regarded as one for which the student composes his own answer, in contrast to a question for which he selects one of several answers provided for him.
2. Short-answer questions, new-type questions, objective questions. The answers to these consist of single words or phrases or of numbers or marks properly placed to indicate the correct answer.

## Essay Questions

Essay questions usually begin with such words as *define, state, locate, compare, explain, illustrate, outline, discuss,* and *describe.*

*Limitations of Essay Questions:* The essay question is the older and time-honored question. In late years, however, serious criticism has been leveled at it. There are two marked objections. In the first place, an essay examination usually consists of only a small number of questions. A small number, it is said does not provide a suffcient sampling of a student's knowledge and ability to enable the teacher to make an adequate judgment.

Second, the scoring and grading of answers to many essay questions

is highly subjective. The answers to discussion questions in particular are complex, and to grade them requires the continual exercise of critical judgment. It has often been demonstrated that, in grading such answers (1) different graders do not agree with one another as to the grade to be given an answer, and (2) a grader cannot agree with himself on the grade to be given an answer when he grades the same answer at two different times. In other words, the grade assigned to an answer for an essay question, particularly one that involves more than one statement, depends to a considerable extent upon *who* reads the answer and to some extent upon *when* he reads it. This is, of course, a serious shortcoming of the essay question. It may be pointed out, however, that the shortcoming can be largely, perhaps entirely, overcome if a key or score card is used by the reader when he grades the answer.

A minor criticism of the essay question is that the answer includes many irrelevant factors, such as the quality of the handwriting, spelling, and English used. It has been suggested that the essay overrates the importance of knowing how to say a thing and underrates the importance of knowledge about it. Moreover, candidates who do not know the answer to an essay question are prone to respond in terms calculated to cover up their lack of information. A friend of mine used to say that a student who was inclined to be garrulous and verbose and who was adept at the use of language could use many words to stir up a heavy dust and get away under cover! Such bluffing may easily mislead the reader of the answers unless he is on guard for it.

Another limitation of the essay question, particularly the discussion type, is that answering it is very time consuming for the student. Many questions require a considerable amount of writing, which is a slow process. The amount of knowledge which a student can set down in writing within the course of an hour is limited indeed. The obvious way to overcome this limitation is to allow a considerable amount of time for the examination, but such time is not always available in crowded schedules. Finally, grading the answers to essay questions is very time consuming for the grader (in this instance the teacher).

It may be suggested here that essay questions can be so constructed as to require brief rather than long essays. This is a very desirable practice for topics or items on which it is possible. One is reminded of the monstrosity perpetrated by a teacher of geography: "Describe the universe and give two examples." Questions of such broad scope are hardly necessary.

*Usefulness of Essay Questions:* In spite of their limitations essay

questions are very useful for certain purposes. For example, an essay question may be better than a short-answer question to show (1) whether a student has his knowledge in organized form and (2) whether he can relate it effectively to specific problems, that is, whether he can use it.

One great advantage of the essay question is that it is rather easily prepared. This statement, of course, needs some qualification, but in general it is true.

The essay question may be employed in many subjects of the dental curriculum, but it is particularly useful to determine a student's ability to interpret and organize information, to put facts together in their proper relationships for a specific purpose, to use knowledge in solving problems. It may reveal (1) accurate knowledge of facts, (2) understanding of difficult ideas, and (3) thinking based on ability to interpret, criticize, and decide. In short, essay examinations are very useful to test a student's ability to make use of knowledge as well as to determine the quantity of knowledge he possesses.

Before leaving the essay question I should say that students should be trained to write good answers to questions. This can easily be done if a few hours are devoted to it. Perhaps a teacher of English can be employed for this purpose, but any member of the faculty should be able to provide such training.

### Short-Answer Questions

There are many types of short-answer questions, but for our purposes we may recognize five: (1) The *one-word answer question,* usually in the form of a direct question which requires a date, a number, a place, an event, a name, and so forth in answer to who, when, how many, where, what, name, and so forth. (2) The *completion question*—a statement from which one or more important words have been omitted, blanks having been placed in the statement for the student to fill in. (3) The *true-false question*—a statement on which the student is asked to pass judgment as to whether it is true or false. (4) The *multiple-choice question*—a question that contains several answers, one or more of which may be true and the other not true; the student is asked to check the right answer or answers. (5) The *matching question*—a question that consists of two related lists of words or phrases, usually arranged in two columns. The student is asked to pair each item in one list with one in the other list.

*Advantages of Short-Answer Questions:* We have noted that essay questions are particularly useful for certain purposes and that they also have several definite limitations. Short-answer questions likewise possess

certain marked advantages or merits, as well as some distinct limitations.

With the use of short-answer questions it is possible, in a limited period of time, to make a rather extensive canvass of a student's knowledge. The number of essay questions that he can answer during the course of an hour or two is small, but in the same period he can handle a large number of short-answer questions. Obviously such a wide sampling of knowledge affords a much better basis for judging a candidate than does the more limited sampling which can be had when long answers have to be written.

Short-answer questions are usually so constructed that only one correct answer is possible. Scoring then consists of checking and counting the right answers; the judgment of the teacher does not enter into the scoring. This is true, of course, only when the questions are properly constructed.

The use of short-answer questions is very economical of time and effort. Within a brief period the student can record on his paper a large number of facts and ideas without undue fatigue and its ill effects on his answers. The brevity of the answers also makes it possible for the examiner to score the answers speedily as well as accurately.

A minor advantage of the short-answer question is that it almost entirely eliminates bluffing on the part of the student. He is not able, through fluent expression and the use of a wide vocabulary, to cover up whatever deficiencies he may have. The short-answer question traps such an expert in language.

*Limitations of Short-Answer Questions:* I have suggested earlier that many examinations should go beyond discovering whether the student possesses knowledge; they should disclose the student's ability to use his knowledge. Short-answer questions serve well to test possession of knowledge; they can also be employed to test application, but it is quite difficult to construct questions that serve this purpose well. Indeed, as one looks at the short-answer questions that are used he notes that nearly all of them are essentially tests of factual knowledge and few, if any, deal with application. Most short-answer questions place emphasis on memory rather than on thinking.

A second limitation in the use of short-answer questions is that many of them are rather difficult to construct. Indeed, so difficult is the preparation of such questions that amateurs are sometimes warned against using them unless they obtain the advice of test specialists when preparing the questions. It is by no means uncommon to find that teachers obtain less satisfactory results with the short-answer type than with the essay type.

The obvious values and merits of short-answer questions lead me to the conclusion that in the future dental teachers—teachers of oral surgery—should use such questions to an increasing extent. I would suggest, therefore, that teachers familiarize themselves with such questions and the purposes they can best serve, learn their merits and shortcomings, and gain experience in constructing and evaluating them.

### Some General Considerations

In constructing examination questions one should take into account several considerations which apply to all types. For example, regardless of the kind of question the teacher uses, he has to state it clearly and in language that will not be misunderstood by students. Involved sentence structure, needlessly heavy vocabulary, or figurative language may so obscure the meaning of a question that a student, even though he knows the point involved, may miss the answer. Such vague words as *few, much, many, some,* and *several* should be avoided whenever possible. They make for obscurity and confuse the student. And of course the questions should be so stated that the answers will not be obvious.

Questions, particularly those of the essay type, are sometimes so broadly stated as to give no indication of the scope, form, or organization of the answer desired. For example, a question such as "Discuss saliva" gives the student no hint as to what kind of answer the teacher expects. A better answer would likely result if the question were elaborated somewhat as follows: "Discuss saliva, stating (a) definition, (b) source, (c) functions, (d) chemical constituents, (e) relation to dental caries, and (f) control in operative procedures."

In view of the difficulties which confront the teacher in devising examinations that will not be misunderstood, I would suggest that he have one or two other competent persons criticize his questions before he prepares the final draft. The questions might well be read from the point of view of how the student will understand them.

Earlier in this paper I suggested that the results of examinations be reviewed by the teacher with his class. There are two reasons for doing this. First, the teacher will discover how the students understood the questions. He may even find out that some of the questions were so bad or poor that they should not be counted in the final scoring and grading. Second, the review is an excellent teaching device, for it provides a splendid opportunity for the teacher to clear up points in the course that were not comprehended by the students. I know, of course, that the examination is usually scheduled as the last meeting

of the class, which does not make feasible a review of results. This is not, however, an insurmountable obstacle. Schedules can be arranged to accomplish what is necessary.

### A Key of Answers

I have previously referred to a written key for the examination. A key consists of the correct answers to the questions—at least it contains the points that constitute the answers. A key is necessary for all kinds of questions—both the essay type and the short-answer type. I would strongly emphasize its importance, *especially for essay questions.* It serves the purpose of a measuring stick. It is not subject to change or confusion as is the mind of the teacher while he reads the answer papers. It helps to keep irrelevant factors out of the way as the teacher grades the papers.

A key for short-answer questions is easily made by marking the correct answers on a copy of the examination. In scoring the answers, the teacher lays the answers alongside the key and then indicates the correct answers with a check mark.

The preparation of a key for essay questions may require a considerable amount of time and effort. How would a teacher go about making one? First, he may for each question put down the ideas, facts, principles, and procedures he wishes to have the correct answer contain. He may have someone else who is competent look over his list to see whether it is complete and correct. He may turn to books and other printed materials, particularly those he has assigned to students for reading; in such materials he may find additional ideas to include in the key. Lastly, he may read a number of the papers turned in by the students for other ideas, for often some answers turn up ideas that had not occurred to the teacher.

A specialist in testing suggested to me recently that, when a teacher formulates a question, he should at the same time put down the points that constitute the answer. Then he should scrutinize the question to determine whether it is properly worded to elicit the desired answer.

In making the key, the assignment of per cents or score points to the questions and separate ideas in each question can be done arbitrarily, each being given the same weight, or the ideas can be weighted, more per cents or score points being assigned to some than to others. No doubt there is some value in weighting essay questions, but probably not enough to justify putting extended effort on doing it. However, you may find it advisable to weight the different ideas in an answer; that would be more useful for some questions than for others.

### KEY FOR SCORING ANSWERS TO AN ESSAY QUESTION

#### A Tentative Example

Question: What factors determine whether missing teeth should be replaced with fixed bridge or a partial denture?

Key: Factors required to answer the question:

1. The number, size, and location of the edentulous areas.
2. Occlusal relationship of remaining teeth.
3. Altered position of individual teeth to be used as abutments.
4. Direction and magnitude of forces to be resisted by the restoration.
5. The health, age, and economic status of patient, and the ability of the operator.
6. General condition of the mouth—predisposition toward periodontal disease, loss of proximal contact, food impaction, pocket development, and caries susceptibility.
7. Health and anatomy of abutment teeth and supporting tissues.
8. A consideration of the greatest possible service with the least amount of destruction and injury to the remaining teeth and surrounding tissues.
9. The need for the splinting effect of a fixed restoration.

### Conclusion

I am sure you know that "good examinations do not just happen." Good questions are rarely the result of a few moments of great inspiration. On the contrary, the preparation of the questions requires a lot of careful, deliberate work. And the proper scoring of the answers and the assignment of grades, particularly when discussion or essay-type questions are used, is an exacting and time-consuming process which can be done well only if a great deal of effort is devoted to learning how to do it.

## THE PREPARATION AND SCORING OF WRITTEN EXAMINATIONS IN ORAL SURGERY[1]

J. J. STETZER, JR., D.D.S.,[2] *Philadelphia*

The testing and examining of students in oral surgery at Temple University School of Dentistry is done, for the most part, by the essay type of examinations. We do not feel that the multiple choice or the true and false type questions are adequate for us to evaluate the student's knowledge of our subject. Perhaps, the true and false questions might be satisfactory for some of the junior dental students' mid-year examinations, whereby definitions are required in a few of the questions. However, we have always thought that if a student could write a definition in his own words, he would have a better understanding of the subject.

[1]Presented before the Conference Session on Oral Surgery, American Association of Dental Schools' Meeting, Philadelphia, March, 1953.

[2]Associate Professor of Oral Surgery, Temple University, School of Dentistry.

For instance, the following are a few questions which appeared in our junior class examination a year ago:

Give the definition of oral surgery as given to you in the lecture room.
What is a compound fracture?
What is ankylosis?
What is inflammation?
Describe a dislocation of the jaw.
What is prognathism and how is it corrected surgically?

It is conceivable that the above questions could be presented and answered by the true and false method. Yet, it is questionable in our minds whether we would get an intimate knowledge of the student's thoughts with these answers. I am sure we who have to mark examination papers would prefer the true and false type for they are so much easier to grade than the essay question. But, do they, in the main, tell us the student's knowledge of the subject?

The purpose of all examinations is to inform the examiner of the student's knowledge of the questions asked. The questions, therefore, are so phrased by the examiners that they might learn from the student what he has learned from lectures, demonstrations, and clinical experience. In oral surgery, we feel that it would be difficult for us to evaluate a student from any type of examination other than that presented in the essay form of questioning. For example, a student may be asked, "What would be the treatment for an inflammatory swelling of the face?" The answer most probably would be to use antibiotics until the condition resolved itself; or if the swelling became fluctuant, an incision and drainage would be advisable. Full credit would necessarily have to be given to this student, but does that answer tell us that the student is well-versed in the treatment of all swellings and the patient's condition as a whole? I do not think so. The following question will give a better criteria to judge a student's ability to diagnose and treat a clinical entity which he will see time and time again in practice: "What would you suspect in a patient developing trismus, dysphagia, pain, and fever following the removal of a mandibular third molar five or six days previously? How would you examine and treat such a case?" Much thought must be given to the many possibilities causing such symptoms. Various examinations are necessary to eliminate certain possible causes and arrive at a diagnosis. However, the use of antibiotic agents may so mask the symptoms, or bring about resolution, that the diagnosis becomes obscure. The way in which a student may answer this type of question would certainly enable one to better evaluate the student's individual ability in diagnosis and how he would treat a very

common condition seen in the every day practice of oral surgery than would be the case if the question were asked differently.

A composite type of question is much more valuable to us in judging a student's knowledge than are those questions which can be memorized and answered in "parrot fashion." We like to phrase a question which gives a description of a patient who presents himself to us in the clinic or in our private practice. Many times that is all we know about the patient. The patient must be given relief from his painful dilemma. We see these individuals now, but in a year or two, our students will be asked to see and treat the same cases. How will they treat them? We are presenting these practical cases to them now in order to judge their ability in evaluating and treating such patients. We feel that this is most practical—and oral surgery must be just that!

Most of our lectures are worked up from our own experience in observing and treating cases which we, ourselves, have seen or are having under treatment at the time. The case history is given, a slide showing the clinical appearance is shown, then slides of the results of the various laboratory examinations. The treatment is described in detail, supplemented with slides showing the progress of the patient. Almost all of the divisions of oral surgery are treated in a practical way. The bed patient, the ambulatory chair patient, and the patient in the hospital operating room are figuratively brought into the lecture room and discussed.

Here is an example: "Give the outline of the treatment you would follow with a patient who presents a firm, nodular mass arising from the gingiva." To answer this correctly, the student must reflect back to his lectures where he has seen many colored slides of these tumors. He was given a brief history and the general characteristics of the growth as he was looking at the slides. Some were benign and some were malignant. In each case, we went through the mechanics of arriving at a diagnosis and then explained the various treatments, progress, and end results. Many of these tumors were seen in the clinic and the hospital where they could visualize the different treatments that were employed for the various types of gingival tumors. It is our feeling that a most comprehensive answer should be obtained from our students for this question.

As stated previously, the true and false examinations appear to be very easy on the man, or men, who have to grade the examination papers. Certainly, the essay type are tiresome and require much more time in grading. However, as educators, we should not take this into serious consideration. Our job is to determine whether a student has

the fundamental knowledge of the subject to go out and practice safely on fellow citizens. This is a grave responsibility and it should not be taken lightly. In grading essay examination questions, we are able to get a pretty good insight of the student's knowledge on the subject in his own words, and the thoughts back of his writings. He may not answer the question directly, but by his indirect methods of thoughts, we are able to evaluate his overall knowledge related to this particular subject. Each question must, of necessity, be read and graded; but the entire examination must be thought of as a unit of that student's knowledge on oral surgery as a whole. This is not easy and cannot be done in a few hours; but, we believe that it is our duty as teachers of oral surgery to devote such time, thought and energy.

## EVALUATION OF TEST SCORING*

JOHN D. GEHRIG, D.D.S., M.S.D.,† *Kansas City*

> "Any scoring procedure whatsoever—in fact the very idea of obtaining a score by summing the data relative to a successful or unsuccessful performance of an individual on a number of unrelated or remotely related items—represents the subordination of a rational philosophy to a practical empiricism."

Even though the above statement has credence, grades in oral surgery are not based on a single performance. There are at least two per quarter or three per semester, and usually about five different performances are totaled to derive lecture grades. Also, tests in our field are not remotely related items, but a definite inventory of the objectives that form the scope of oral surgery. By keeping these objectives foremost in our minds while constructing the items, we can make our test scores much more meaningful. Test scores are put to the following uses: assigning grades; promoting students; improving effectiveness of instructions; planning and revising curriculum; educational, vocational, and social guidance; research.

In oral surgery the first four are of prime importance. The first two require the necessary evaluation of students, while the next two are designed to assist the teacher in his introspective education. A test, it should be remembered, tests not only the examinee but the examiner as well.

At present, scores provide us with some prognostic value of the student's ability to cope with future oral surgery problems. With diligent

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†Professor and Chairman, Department of Oral Surgery, University of Kansas City, School of Dentistry.

care on our parts with respect to the construction, administration, and scoring of tests, we can appreciably widen this scope of evaluation in our profession.

No score is any more meaningful that the test itself. Therefore, the individual items must embody the following six attributes of an ideal examination. They are:

1. Validity—It must actually measure what it is supposed to measure.
2. Reliability—It must do this accurately and consistently.
3. Objectivity—It must be fair to the students—clear, no ambiguity.
4. Discrimination—It must separate the good students from the poor.
5. Comprehensiveness—It must be long enough to cover the field adequately.
6. Ease of administration and scoring—It must be easy to use.

Many valid and reliable tests have been vitiated due to faulty administration; therefore, in order to insure success, the instructions to the examiner should be explicit. In administration the essentials are:

1. Timing—Set the student's mind at ease by allowing adequate time for response and checking the response. Reassure the students of this. (Speed is not a factor in our field.) Announce loudly and clearly the time limits of one-quarter, one-half, three-quarters and full test time, plus an extra ten minutes leeway.
2. Directions—These should be clear and complete, do not read over written items on test. Do proof reading prior.
3. Scoring—The scoring procedure, weights, correction for guessing, and any other data pertinent to the test should be given.
4. Motivation—This is very important but rather obvious in our field. Students should be warned of test in advance.
5. Physical conditions—These should be as adequate as possible for the situation. Steps should be taken to control chance or purposeful copying.
6. Questions—answered. A five minute question period should be allowed before starting the test.

Remember very few people would entrust the administration and scoring of an individual Standford-Binet Scale to anyone but a psychometrician, and yet it is a far more exacting task to administer and score a group test, so we should be careful in the selection of our administrator and scorer. Well informed personnel are by far the most efficient.

Finally, we reach the scoring of the objective test. If the first two steps are carefully planned, the scoring is greatly facilitated and the results valid and reliable. Manual scoring may be speeded by several methods:

1. Punch keys—punched out over correct response.
2. Cut-out keys—cut-out response slots.
3. Fan keys—all correct answers for several pages on one folded sheet.
4. Overprinting—re-mimeographing—usually works well.
5. Carbon paper—expensive.

If the test author wishes to make the test amenable to the scoring machines, he can have them scored in a short time with no labor problem. But it takes many more hours of test planning and construction to attain this goal. The Chicago University Testing Bureau is the ultimate of this type of testing. For small groups of 100 or less, the manual method with the proper key seems to work satisfactorily.

The construction rules and scoring methods are directly applicable to objective items, but subjective items present an entirely different problem. The difficulty encountered in the construction of items for the subjective or essay test is reflected in the scoring. The application of the six criteria is difficult; therefore, in the subjective responses, the factor of personal equation significantly affects the grading. Some of this is alleviated by the use of numbers instead of names.

To be accurately graded the essay items must have:

1. A limitation of the freedom of response.
2. Assigned point value—a response made up of many elements, each of which should have an assigned point value.
3. Objectivity is mandatory.
4. Adequate time for response and checking of response is necessary.

In order to follow the above suggestions the test author must first define his field in terms of objectives and subordinate objectives (or elements). Then he must direct his items at some integral segment of the field and outline the expected student response. He should check and recheck his essay items in terms of the required response before using it. Preferably, he should let his staff or selected students attempt the response and thereby insure objectivity and timing. If the item has been properly checked and the response is foremost in the scorer's mind, the correction process is stepwise. All papers for that individual item are read. On the second reading the item is scored. This will eliminate one question influencing another in point scoring. One method used to aid in this lengthy operation is to have each staff member grade one essay item after he has been thoroughly indoctrinated in the scoring and correct response of that item.

The scoring of essay items should be on scholarship only, and not on penmanship or grammar, unless the students have been adequately forewarned prior to administration of the test. Lecture grades should include daily work, class tests, oral quizzes, mid-term and final examinations. Our clinical grades may cover diagnostic and operative abilities, handling of patients, personality, initiative, industry, and such traits.

Even though the essay item is less valid and reliable and much harder to score, it has a very definite place in testing. By good subjective items,

it is possible to create a situation or problem to which students may react by organizing and evaluating given data, drawing logical conclusions, and thereby instituting correct treatment. By essay items we can measure the overall comprehension of the course and not parrot-like responses many times elicited by objective items.

Due to abuses in construction and the difficulty in scoring, the validity and reliability of the essay item is hard to measure. Therefore, the trend in modern testing has been toward objective rather than subjective type tests. With strict adherence to constructive and diligent work, we can bring the essay item back to the favor which it so richly deserves.

With the scoring completed we must evaluate the results. Merely giving a student the number of correct items on his paper is meaningless. Therefore, the grade given must be relative to the other students to be meaningful. Thus a percentile grade is necessary. At least three other measurements should appear on the student's paper.

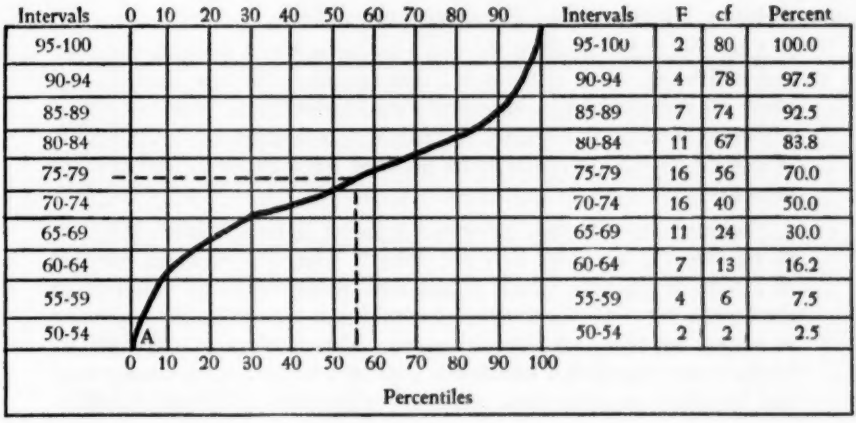
1. *The percentile*—80th means 80 per cent did poorer than the student and 20 per cent better.
2. *The mean*—arithmetical average.
3. *The median*—50 per cent were above, 50 per cent fell below this point.
4. *The mode*—the score which the most students received.
5. *Standard deviation*—this may be added to enhance group comparisons.

It behooves each of us to be familiar with the above computations.

A raw score by itself is meaningless, but after it is changed to a per-

PERCENTILE GRAPH FOR A NORMAL DISTRIBUTION

(Mecheels and Karnes, p. 437)




| Intervals | F | cf | Percent |
|---|---|---|---|
| 95-100 | 2 | 80 | 100.0 |
| 90-94 | 4 | 78 | 97.5 |
| 85-89 | 7 | 74 | 92.5 |
| 80-84 | 11 | 67 | 83.8 |
| 75-79 | 16 | 56 | 70.0 |
| 70-74 | 16 | 40 | 50.0 |
| 65-69 | 11 | 24 | 30.0 |
| 60-64 | 7 | 13 | 16.2 |
| 55-59 | 4 | 6 | 7.5 |
| 50-54 | 2 | 2 | 2.5 |

centile, it gives the student his relative standing to the other members of his class. The mean is the exact arithmetical average. The median is the 50th percentile or 50 per cent of the students did better and 50 per cent did poorer. If the median is exactly the mean then the test is perfect with respect to validity and reliability. The mode is the score that most students receive and if it's at the median, it is again proof of validity and reliability. The standard deviation, or sigma, is a measure of dispersion which is useful in making comparisons and in establishing standard scores for assignment of letter grades.

After scoring, a simple item analysis can be performed to designate excellent, good, fair, poor, or bad items. The tested group is divided into thirds and each item is checked to reveal the percentage of superior, average, or poor students that can answer the item correctly.

| Item | Superior students top third | Average middle third | Poor students bottom third | |
|---|---|---|---|---|
| No. 65 | 82% | 49% | 10% | Excellent |
| No. 22 | 65% | 60% | 12% | Fair |
| No. 15 | 29% | 31% | 54% | Bad |
| No. 43 | 97% | 86% | 83% | Bad |
| No. 88 | 83% | 22% | 18% | Poor |

Naturally, the ideal item will be easy for the superior student, of average difficulty for the average student, and very difficult for the poor student. Item No. 65 is ideal because it does just that. Item No. 22 is only fair since there is only slight discrimination between the middle and the upper thirds. Item No. 15 shows a reverse discrimination; therefore, it is a bad item. Item No. 43 is much too easy for all three divisions, while item No. 88 is much too difficult.

After this simple analysis the test may be rescored omitting the poor and bad items. Even if the test is not rescored, the item analysis will allow the test author to accumulate a card index file of good items filed according to validity, difficulty and scope. In a few years, with hundreds of items collected test construction becomes much easier as well as more reliable.

"Young people become interested in what is taught when they see its relevance to the thing they are doing." This quotation has ushered in a field of research which is just now being exploited. Courses in the correlation of the basic sciences with dental instruction are beginning to appear on our professional horizon. The problem in our field is: Is there any correlation between a student's basic science background and his ability to solve given oral surgery problems in written examina-

tions? In this correlation, two suppositions are eminent. If the student is exposed to oral surgery instruction, his responses will be colored. Also, if a student did well in his basic sciences, he probably will do well in oral surgery simply due to his initiative, interest and intelligence. Therefore, it would seem that if the student could be tested after his basic sciences were completed and before being exposed to oral surgery instruction, the correlation might be more significant. This problem is ripe for research.

At the University of Kansas City, School of Dentistry, several variations of testing have been tried to stimulate thought processes rather than rote memory:

1. Slides and diagnosis.
2. Radiographs—classification, diagnosis and surgical treatment of impactions.
3. Actual case histories which replace organization and evaluation of data for the diagnosis and treatment.
4. Clinic patients with radiographs and case histories are presented as in clinical pathology conferences.

Weekly quizzes corrected immediately are useful for instructional purposes as well as for improving motivation, the introduction of lecture topics, and short discussions. It has been our endeavor to lean toward essay items in these short quizzes. The students' responses have been favorable and conducive to stimulating interest in the entire field.

As has been proposed at the beginning of this paper, each of us can, by diligent study in the field of testing, contribute much to broaden the educational horizon of dentistry.

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# III. DENTAL HYGIENIST EDUCATION

*(Of the two presentations before this Conference Session, the following is the only one made available for publication.—Ed.)*

## WHY STRESS DENTAL ANATOMY IN THE DENTAL HYGIENE CURRICULUM?[1]

M. A. HOLZHAUER, D.D.S.,[2] *Milwaukee*

First of all, permit me to read the definition of the function of Dental Hygiene Education as adopted on July 2, 1949, by the Council on Dental Education of the American Dental Association:

> "The prime function of the dental hygienist is to assist the members of the dental profession in providing oral health care to the public. She may apply her knowledge and skills either in the office of the private practitioner, or in formal health educational activities in schools or other agencies. In either instance, she can and should perform an important function in health education."

To perform these duties, the hygienist is expected:

1. To do a good prophylaxis.
2. To make a thorough mouth examination.
3. To teach the proper care of the mouth.
4. In children, to teach the parent the importance of oral hygiene and the necessity of maintaining the deciduous arch by having damaged structures restored to normal use and function.
5. To take and interpret x-rays properly.

What role does dental anatomy play in the teaching of these functions? To adequately perform a prophylaxis, the student must know the shape and form of all teeth, thus enabling her to select the best instrument suited in each particular instance, the right shaped scaler for the particular curvature of the teeth. She must be able to recognize the cervical line and thus differentiate between calculus and the heavy cemento-enamel junction.

In making a thorough mouth examination she must know what the normal arch consists of. The normal must be known before the abnormal can be recognized. She must also have a thorough knowledge of the terminology in order to classify the areas of caries and all other abnormalities present. This knowledge of terminology can best be taught in the dental anatomy course.

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[1]Presented before the Section on Dental Hygienist Education, American Association of Dental Schools' Meeting, Philadelphia, March 24, 1953.

[2]Associate Professor of Preclinical Operative Dentistry, Marquette University.

To teach proper care of the mouth, the student must know the form and function of all structures in the oral cavity, which will enable her to realize the necessity for maintaining the normal dental arch, and the reasons for proper use of the toothbrush and aids necessary to keep a clean and healthy mouth.

In children's dentistry, a proper knowledge of the development, exfoliation and eruption of the teeth is essential in teaching the importance of preventive dentistry. The use of space maintainers in the deciduous arch must be explained to the parent.

The dental hygienist is expected to take x-rays, and here a clear knowledge of the different curvatures of the lingual aspects of the teeth, as they form the angle with the x-ray film, will better enable the operator to place the line of x-ray in the proper direction, thereby preventing either the foreshortening or the elongation of the picture itself.

Included in the definition adopted by the Council on Dental Education is the following paragraph, and again I quote:

> "At the discretion of the dentist, the dental hygienist may be required to perform other importance office duties for which her training in the hygienist school may have prepared her."

In order to prepare the student for these additional functions, the following must be included in the hygiene curriculum:

1. The making of good models, baseplates and occlusal rims.
2. A knowledge of setting up teeth in denture prosthesis.
3. The carving of wax patterns.

In the January, 1951, issue of the *Journal of Dental Education*, Doctor J. W. Ashton, of Indiana, made this statement in reference to the aims and ends of the pre-dental program:

> "As a preparation for his dental work, the student needs to master certain skills which are basic in all the work that he will do. . . . He must learn to work in a laboratory, to be able to manipulate the various kinds of apparatus, to establish a particular kind of manual skill and dexterity which it will be important for him to possess, not only as a student in the dental school, but also in his practice. . . . More than that, he needs to develop an understanding of what laboratory work means in terms of carefulness and accuracy."

The above refers to a dental student, but I feel that it applies equally to the dental hygiene student. Where, better and more quickly, could the hygiene student learn manual skill and dexterity, carefulness and accuracy, than in the course of dental anatomy? This trait must definitely be shown in the making of good models, baseplates and occlusal rims. Without a good knowledge of the terminology and nomenclature

of the teeth, it would be practically impossible for the student to set up teeth in dental prosthesis.

The carving of wax patterns is becoming increasingly more important, with the tendency today toward the indirect-direct methods of gold inlay and crown restorations. If the dental hygienist is expected to carve wax patterns we must definitely stress the teaching of dental anatomy. No other subject in the hygiene curriculum is better suited to prepare the student for this phase of her education.

Permit me to present the method of procedure we have developed at Marquette University in the teaching of dental anatomy to the hygiene student. I am deeply indebted to the teaching staff, and especially to Doctors Gunnar Ryge and Carl Wilhelm, for helping to organize this plan of teaching.

We must remember that the hygiene student, in most instances, is only a high school graduate. This is too frequently forgotten. I well remember the first rule given in an elocution course I took some years ago. "Always remember that the members of your audience are cabbage heads. They know nothing of what you are going to tell them. Explain it well!" How true this is when meeting a freshman class for the first time. They know nothing about dentistry. The only part of a tooth they have seen is the labial aspect of the upper anteriors. There is no conception of the three dimensional shape or form, no visual knowledge of the crown and root form. With this in mind our first lecture is on: (1) the names of the teeth, (2) the number, (3) the position, and (4) the function.

To elaborate upon these four basic principles, pictures are shown of all the different types of teeth. At the conclusion of this lecture an assignment is given on the nomenclature. A mimeographed list of the most important terms, with which the student comes in contact, is given to each. This list is a copy of the glossary from Wheeler's first edition.

In the next lecture we begin a discussion of the rules of curving. As we know, there are several characteristics pertaining to curving, inclination, convergency, divergency, etc., which hold true, not only for a certain group of teeth, but in many instances, for all teeth in the dental arch. We have attempted to put these general rules together under the designation "Rules of Curving." Pictures of the teeth are again shown and the rules of curving are explained as they apply to the different types of teeth. A copy of these rules is given to each student.

At the next meeting the rules of curving are again discussed and it is shown how they apply to one particular tooth. At this point we

begin the first laboratory session and here the student is given extracted natural teeth of the upper and lower arches and of either side. A cuspid might be from the right side and the molar from the left. The student is asked to make a chart of this type, forming blocks or spaces for each quadrant. Two hours' time is utilized by the student in identifying the teeth given her. At first thought this might seem excessive, but one must consider that the student has never seen the whole tooth and this is her first experience. One is surprised how readily the student recognizes upper from lower and right from left. She is now applying her knowledge of the rules of curving. By this time the student must use the proper terminology, giving the names of the surfaces, etc. At the end of this session a textbook assignment on the lower right first molar is given. We are using Doctor Wheeler's Dental Anatomy and Physiology Text. A complete description of the molar is given, using pictures obtained from Doctor Linek's Laboratory Manual. The rules of curving are explained as to how they are adapted to this particular tooth. A digest description is given the student.

At the next laboratory session the student begins to reproduce the lower right first molar in wax. I choose here to explain why we have the student reproduce the lower molar first. We have found that the teaching of the rules of curving adapts itself much better to a larger tooth. It is comprehended much better and the student can apply the rules much easier to a larger surface. The curvings on a molar are not too exaggerated. This is the second year this method has been in use. It has proven successful and to the student's advantage.

We use Monson's green wax. We find that green is much easier on the eyes and does not cast as much reflection as does ivory colored wax, thus permitting the student to visualize the curvatures more readily. Monson's wax does not flake as easily as others.

The student reproduces one-half of the dental arch, upper and lower, on the same side. After the molars we proceed with the anteriors. The method of procedure outlined above is followed by the student in reproducing each tooth.

The instruments we use are: Coke No. 3, Mortonson No. 1, Hollenbeck No. 3, heavy handle carver, Murphy knife No. 2½, Dixon's caliper and Evan's carver.

For a class of forty-two we have a staff of four, three dentists and one graduate hygienist. Each step is checked by an instructor and the finished product graded. We are on a three-quarter semester basis, with 96 hours the first two quarters and 24 hours in the third quarter. The

minimum requirement is 96 hours. Our total is 120 hours. A written examination is given at the end of the first and second quarters. At the end of the third quarter, in the final examination, the student is expected to reproduce completely, in wax, any tooth designated by the instructor.

While we do not feel that this method is the acme of teaching dental anatomy, we are ever striving to find better means and methods which might help to give the student better knowledge of the subject and an easier understanding of that which is expected.

In conclusion permit me to quote a few phrases taken from an editorial in the January, 1953, issue of the *Journal of Dental Education*: "Good teaching cannot be mere telling." "Good teaching cannot result from memory work or mere reciting." "Activity without thought as to application has no value in teaching, . . ." "He (the teacher) must help a student to find out for himself." "Not much can be done without a previously worked out plan." "With all the changes that have taken place within the profession of dentistry, including teaching, one who has witnessed it all can realize and fully appreciate the present. But we cannot stop with the present, nor feel that the ultimate has been attained—it never will be. . . ." "There is and must always be room for improvement, even in teaching."

# COLLEGE NEWS

## *University of California:*

A complete survey of the curriculum, which was initiated by faculty action and placed under the direction of its Curriculum Committee, has been started with the appointment of Dr. B. Frank Gillette.

Dr. Gillette, who received his doctor's degree from the Stanford School of Education, has been authorized to make a complete analysis of the curriculum. This analysis, to extend over a period of four months, will include a survey of courses and teaching methods, using all appropriate sources of opinions, such as faculty, alumni, students and dental educators from other colleges.

The faculty is interested in determining the degree of professional competence expected of a dental graduate. What should be the objectives of the undergraduate curriculum? What should be delegated to postgraduate years?

The objectives of the survey have been stated by the Curriculum Committee as follows: 1. To determine the knowledge, skills, experience and attitudes we believe a graduate of the University of California, College of Dentistry, should possess. 2. To determine what preparation is necessary to equip the student to meet our concept of present day practice and future professional growth. 3. To determine the adequacies and inadequacies of our present curriculum.

## *University of Illinois:*

Dr. Roy J. Gillette has been appointed assistant professor of histology in the dental school. He will serve on a half-time basis while continuing on a half-time basis at the University of Chicago, where he holds the rank of assistant professor of natural sciences.

In the 1952-53 fiscal year, 831 new patients were referred to the University by welfare agencies, 3812 new patients were admitted to the clinics. Representative of services provided patients are these: 1627 units of dentures constructed; 7700 teeth extracted; 6000 fillings placed; root canal therapy on 4000 teeth; 2000 patients treated for periodontitis; 1000 units of crown and bridge work performed; 750 orthodontic consultations and examinations; 9000 patients x-rayed; and approximately 2000 patients treated in Children's Dentistry. In the latter clinic, the dental student is introduced to the patient in his first year and has an opportunity to follow the same patient for four years.

## *Temple University:*

Dr. Daniel J. Rossi, who recently completed a one-year course of study in oral surgery at the University of Pennsylvania Graduate School of Medicine, has been appointed part-time instructor in oral surgery. He is Resident in Oral Surgery at the Pennsylvania Hospital.

Dr. Jacob M. Wisan, Chief of the Section of Dental Health of the Philadelphia Department of Health, has been appointed part-time lecturer on public health.

## *University of Tennessee:*

Bids were opened recently for conversion of the fifth floor of the dental building into an orthodontic clinic. This project will enable the college to offer its first graduate course for dentists leading to a master of science degree in orthodontics.

The new program will be an 18-month course on a full-time basis under the direction of Dr. Faustin N. Weber. Applicants will be accepted twice annually, in January and July.

## *Tufts College:*

Three postgraduate courses are announced: 1. A three-day course (April 28, 29, 30, 1954) in Partial Denture Construction under the supervision of Drs.

Lawrence Clayman and Louis Schorr; 2. Occluso-Rehabilitation I, a lecture and seminar course (September 20-24, 1954); and 3. Occluso-Rehabilitation II, a special participation course every other week on Friday and Saturday for seven months beginning October 15, 1954. The two latter courses are given by Dr. Louis A. Cohn.

Refresher courses are announced as follows: Oral Pediatrics, July 12-16, 1954, by Dr. John C. Brauer; Inlay Construction, April 11-15, 1954, by Donald A. Keys.

The Fifth Annual Berkshire Conference in Periodontology and Oral Pathology will be held at Falmouth, Massachusetts, June 20-24, 1954.

For details write Dr. Irving Glickman, Director.

## BOOK REVIEWS

**Complete Dentures,** by Merrill G. Swenson, D.D.S., F.I.C.D., F.A.D.P. Third edition; 688 pages, 882 illustrations, 10 in color. C. V. Mosby Co., St. Louis, 1953, $13.50.

This new edition has the same fine clarity and wealth of explanatory photographs as the previous ones. The subject is taken up in logical procedure and with considerable detail. Exception could be taken to the verbatim quotations from other texts and/or articles, with no evaluation or discussion, favorable or not, of the quotation. One in particular, the Stansbery plaster check bite technic, is merely named and then shown in a series of step by step illustrations, with no discussion of its advantages or hazards.

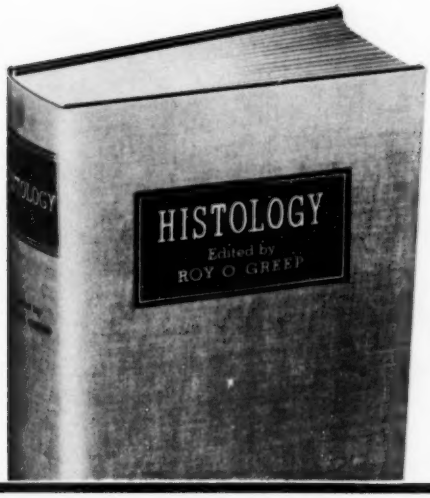
A discussion of the use of alginate impression material for preliminary edentulous impressions would, it seems to me, have been a useful addition. The all compound, or compound and wax technic for preliminary impressions, while excellent, are unduly laborious, especially in students' hands.

At the present time this textbook impresses me as the best in its field for undergraduate study and postgraduate reference. An unusually complete appendix, chronologically relating important events in dentistry, and a bibliography subdivided into each phase of denture prosthesis complete the book. —*Harry Berger.*

**Accepted Dental Remedies, 1954.** This book is the nineteenth edition of a valuable and practical reference for both the dental practitioner and the dental teacher. It is published annually and each year is completely revised to bring its information into the most current form available. As stated in the preface, "No edition of Accepted Dental Remedies should be relied upon for current reference beyond the year of publication, because the status of dental products is constantly changing."

The book contains a statement of the general provisions for acceptance of dental products by the Council, as well as a listing of accepted products. There is also a valuable section on prescription writing, containing the fundamental principles for the writing of general and narcotic prescriptions. The various sections on drugs contain not only brief, although excellent, general descriptive material, but for each drug or preparation space is devoted to chemical makeup, properties, actions, uses and dosage.

The text is well supported with an extensive bibliography and contains additional material regarding emergency measures, treatment and symptoms of acute poisoning, and formulas and tables. Indexing includes one section for distributors, one for other current Council Reports, one for products not included in A.D.R. and one general index. Published by American Dental Association, Chicago, 1954, 207 pages. Price $2.00. —*Robert W. Rule, Jr.*

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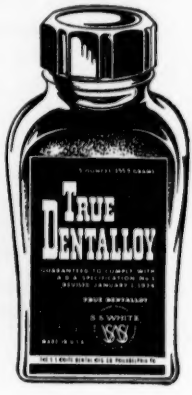


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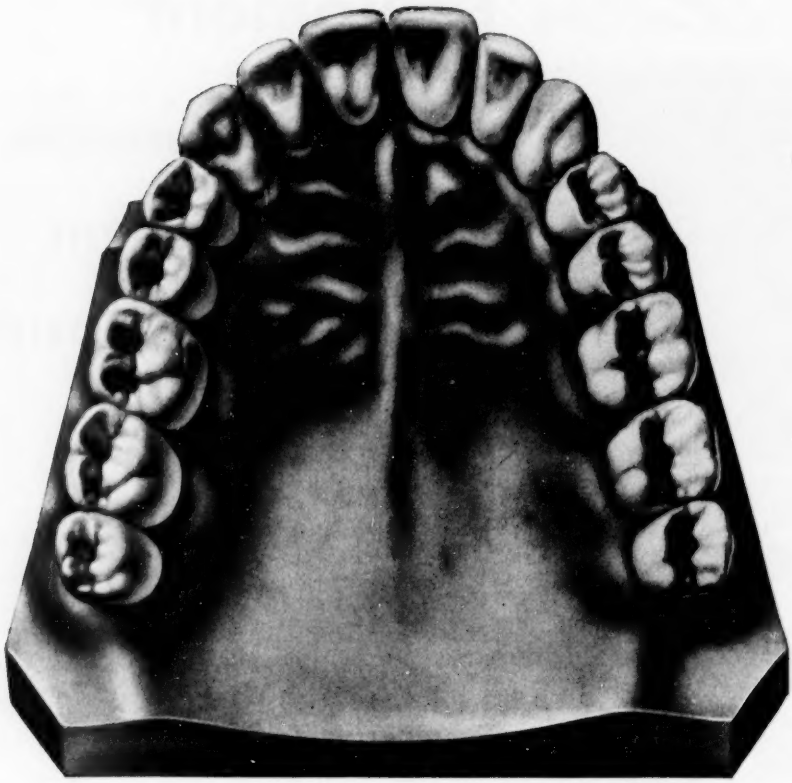

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